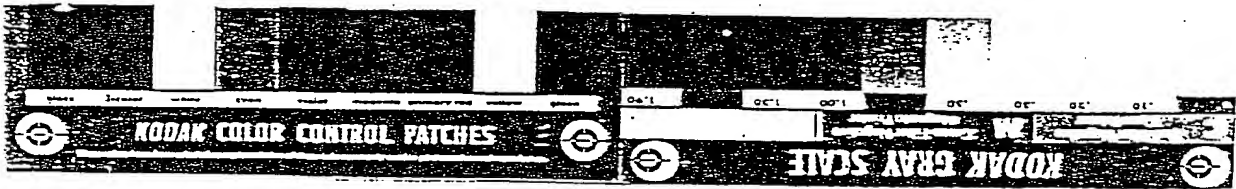


Fig. 1

Color comparison of various passive layers



Substrate: Zinc-plated screws

Blue chromation:	Left picture half
Invention:	Center
Yellow chromation:	Right picture half

TOP SECRET

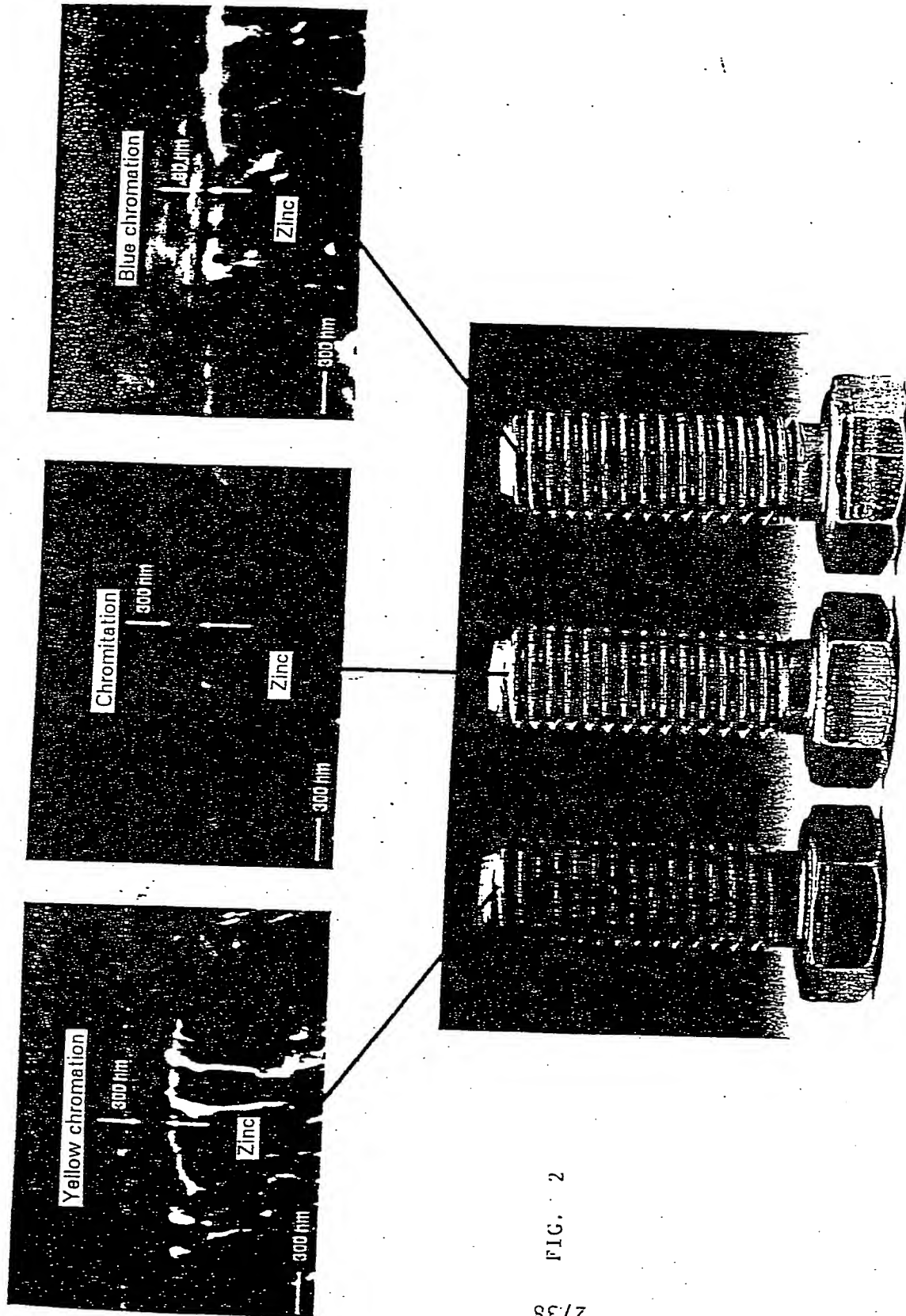
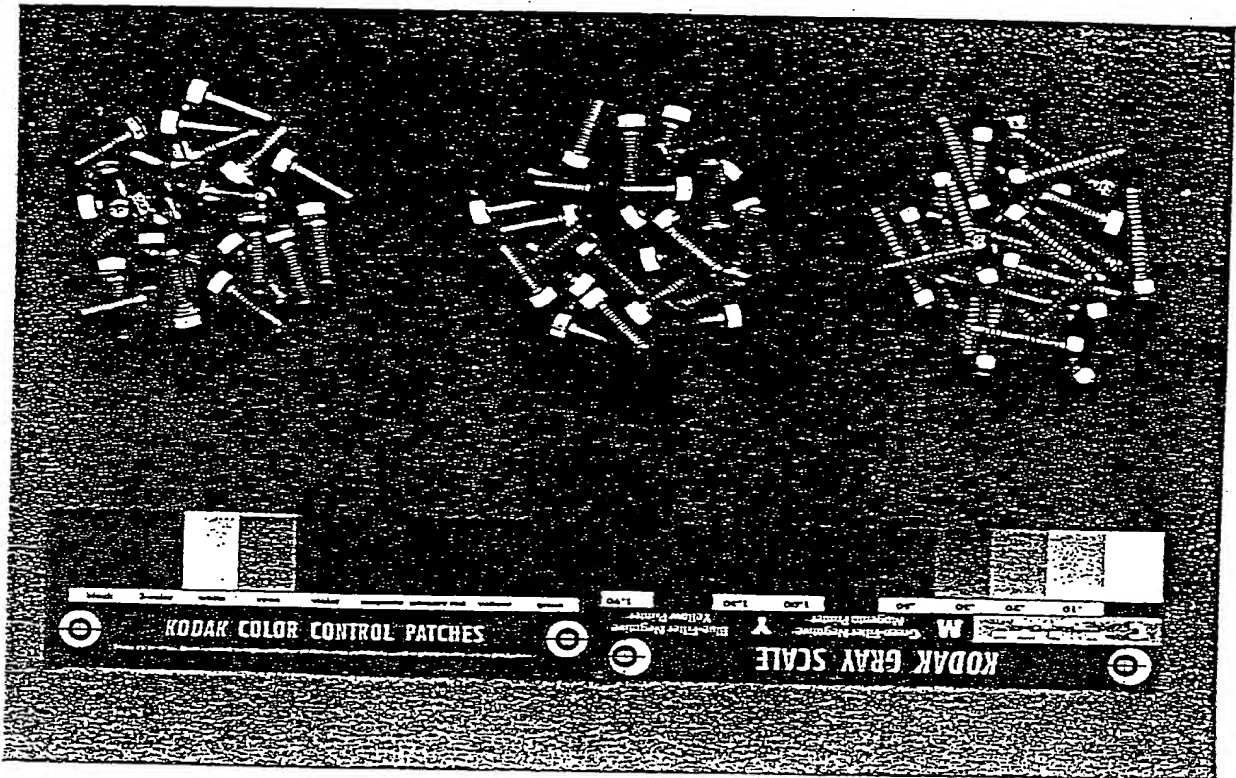


FIG. 2

Fig. 3

Bandwidth of iridescence according to the present invention
(on zinc-plated screws)



TOP OF "C640660"

Fig. 4

Comparison test with EP 0 034 040

Example 16

Example 17



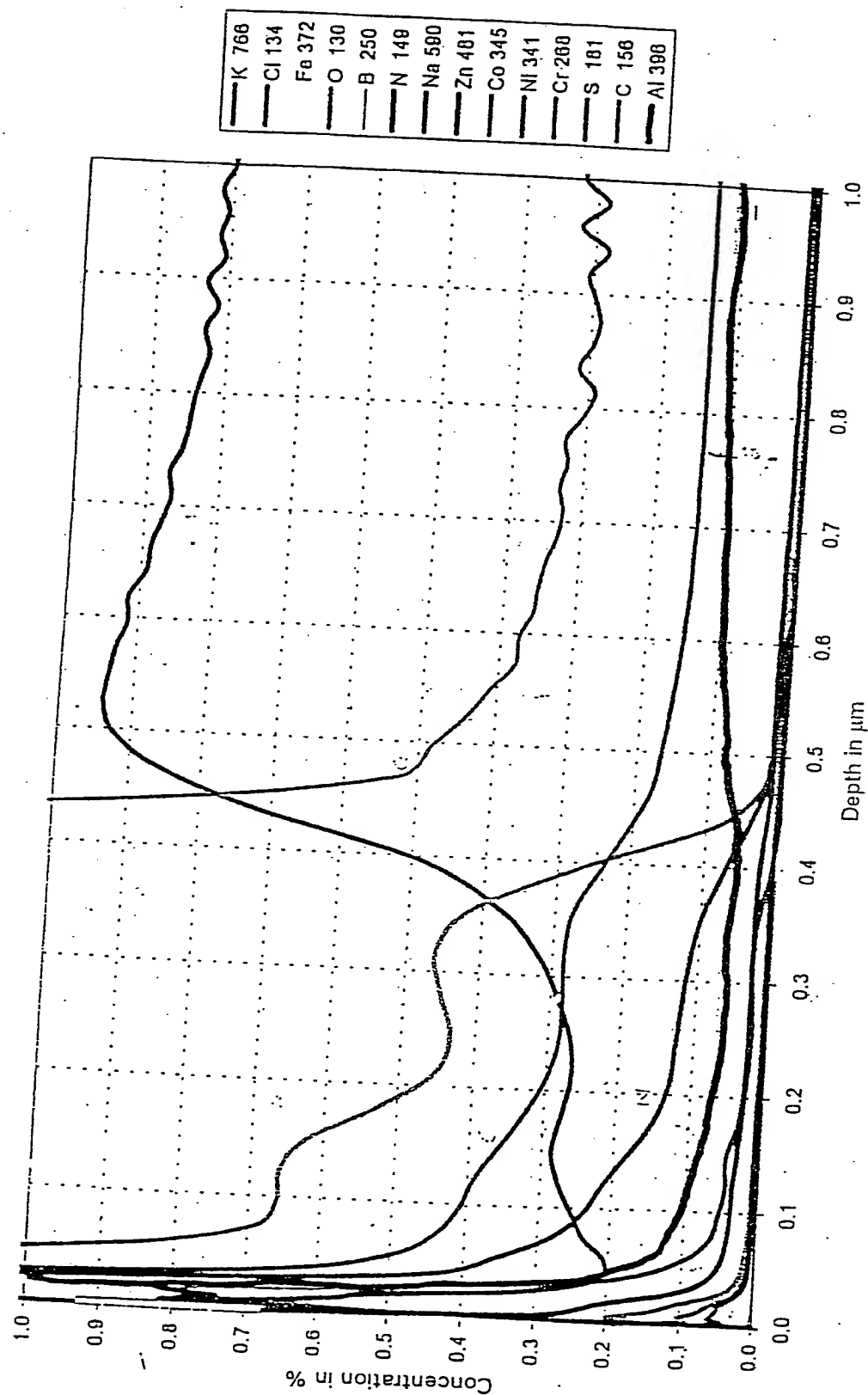
The upper picture half, one the outer left and right, shows a black cloth whereby the abrasions on the metal sheets shown in the top picture half were obtained. Layer portions - discernible as whitish stains - are on both pieces of cloth. The lower picture half shows the unmarred layers of the prior art.

Substrate: Zinc-plated steel sheet.

FIG. 5

Diagram 1

Pattern 1, Measurement Position A



—	K 766
—	Cl 134
—	Fe 372
—	O 130
—	B 250
—	N 140
—	Na 590
—	Zn 481
—	Co 345
—	Ni 341
—	Cr 268
—	S 181
—	C 156
—	Al 390

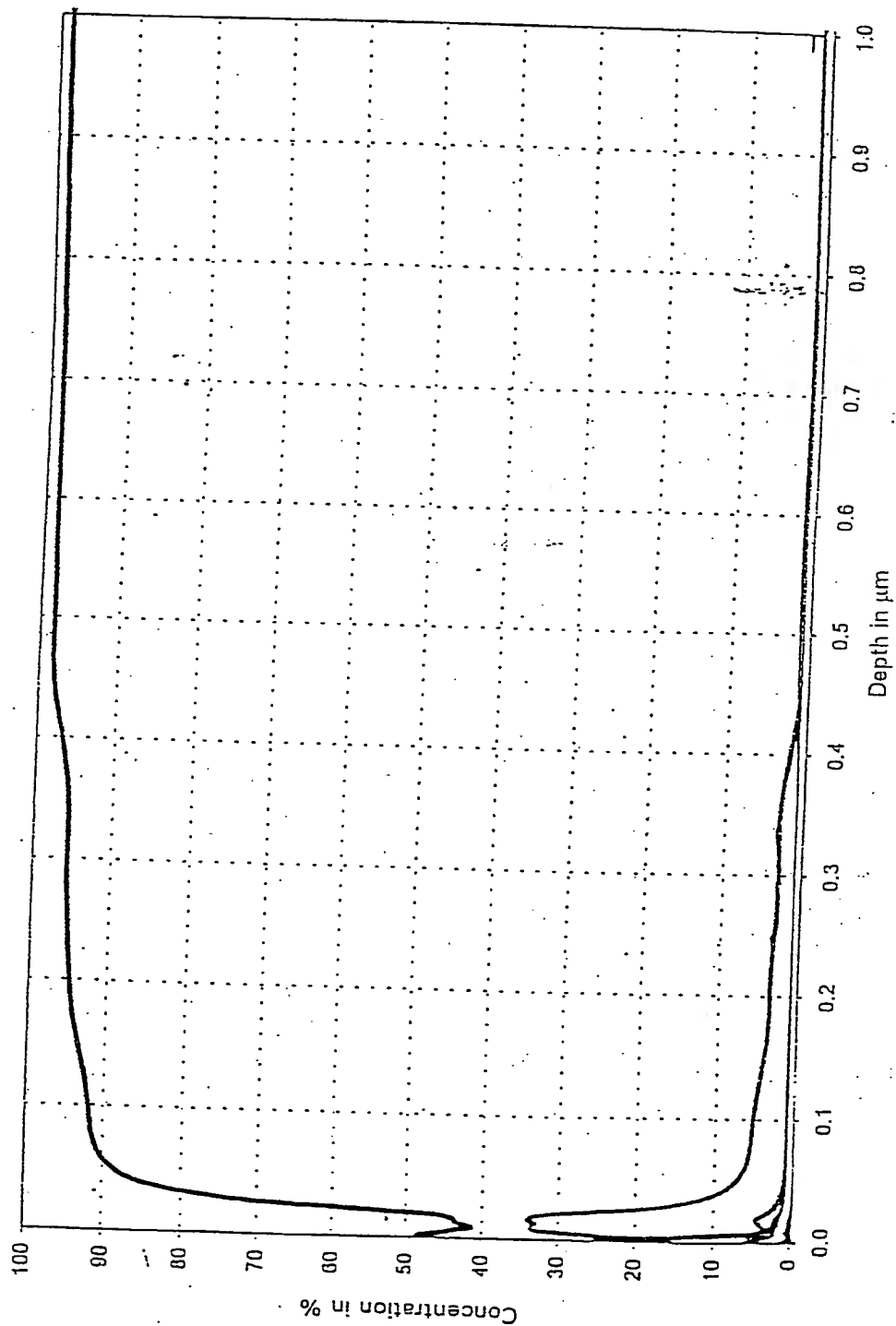


FIG. 6

Diagram 2

Pattern 1, Measurement Position A

T00F0T" E6670660

Diagram 1

Sample 1, Measurement Position B

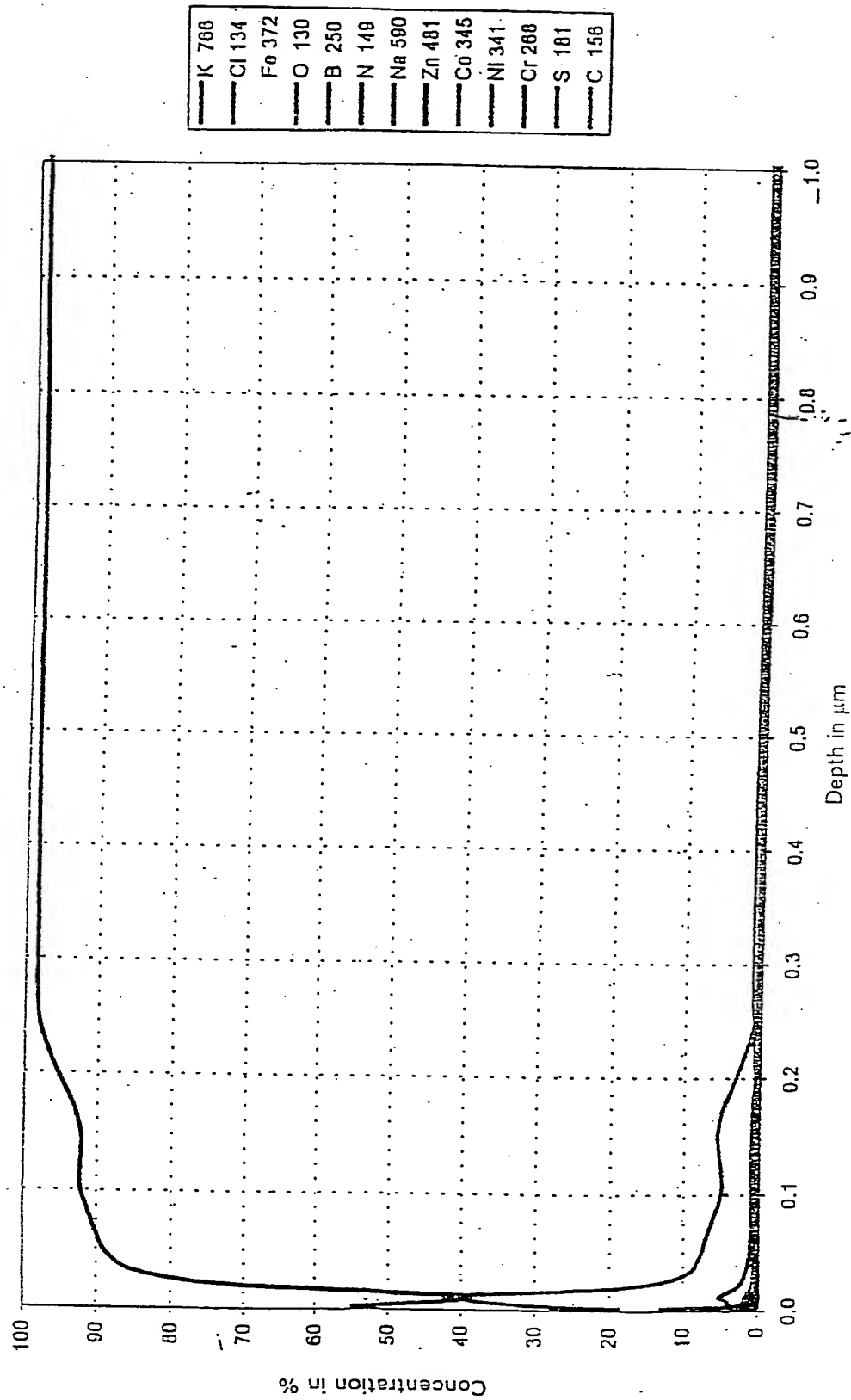


FIG. 8
Diagram 2
Sample 1, Measurement Position B

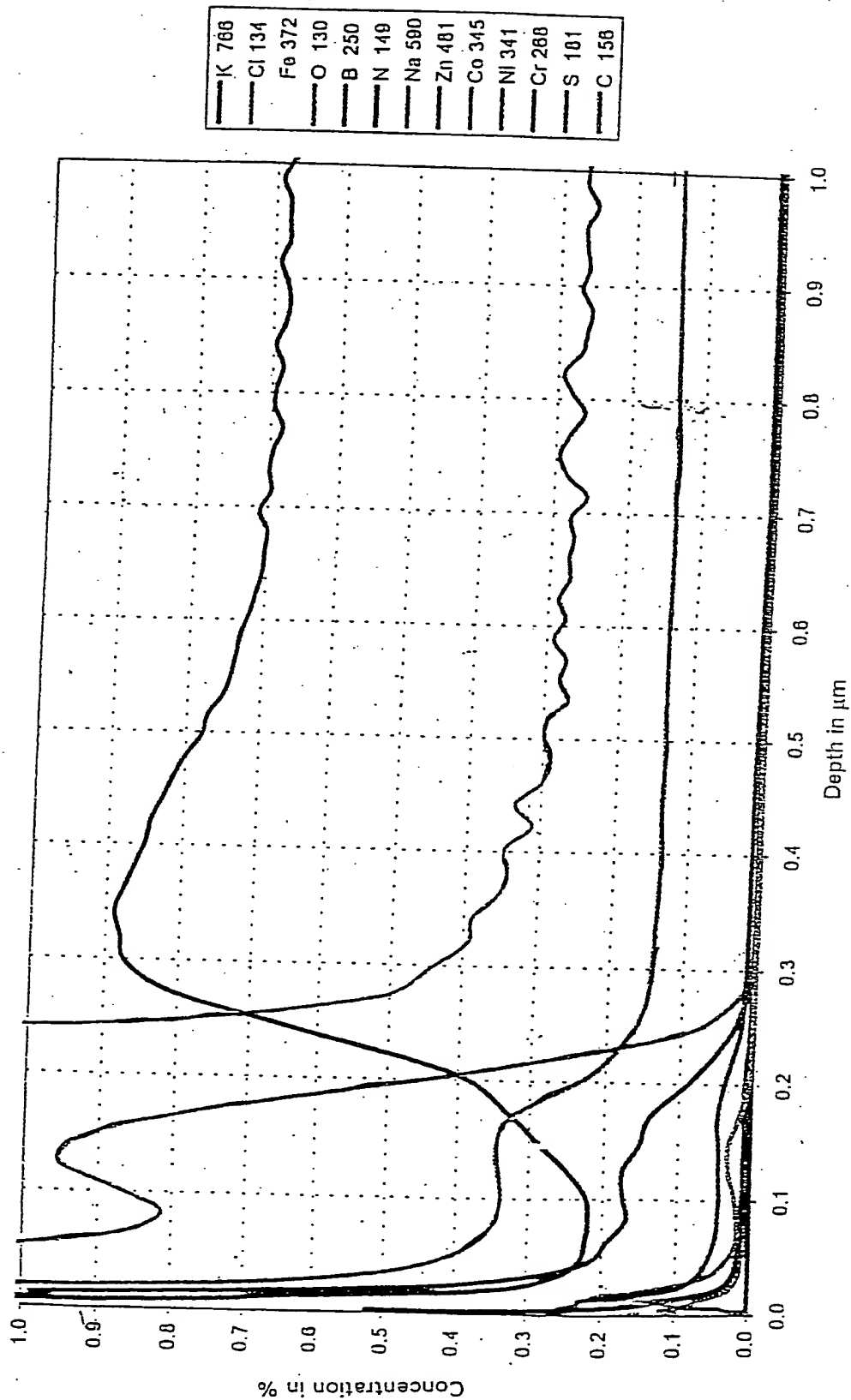


Diagram 1

Sample 2, Measurement Position A

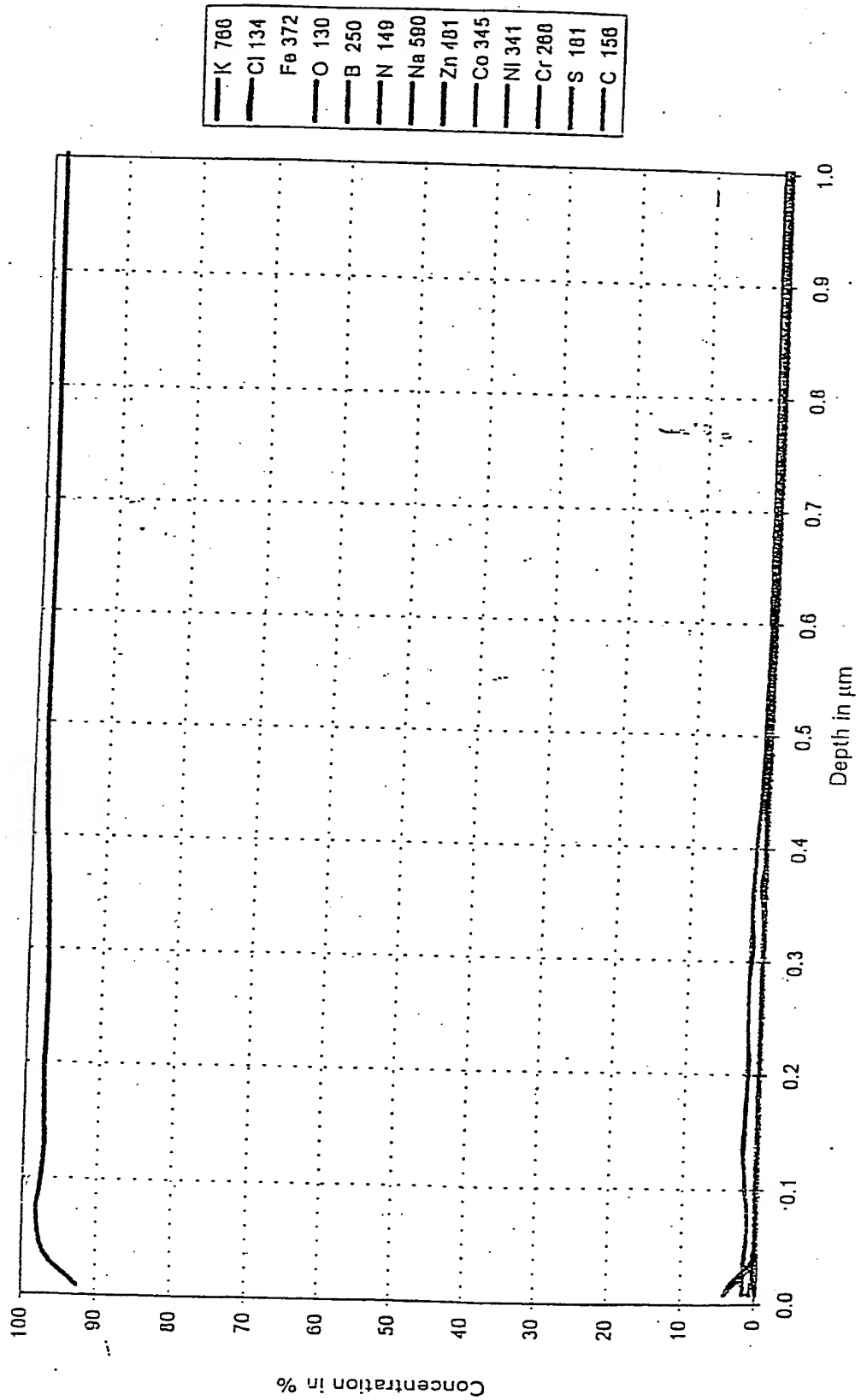


FIG. 10

Diagram 2

Sample 2, Measurement Position A

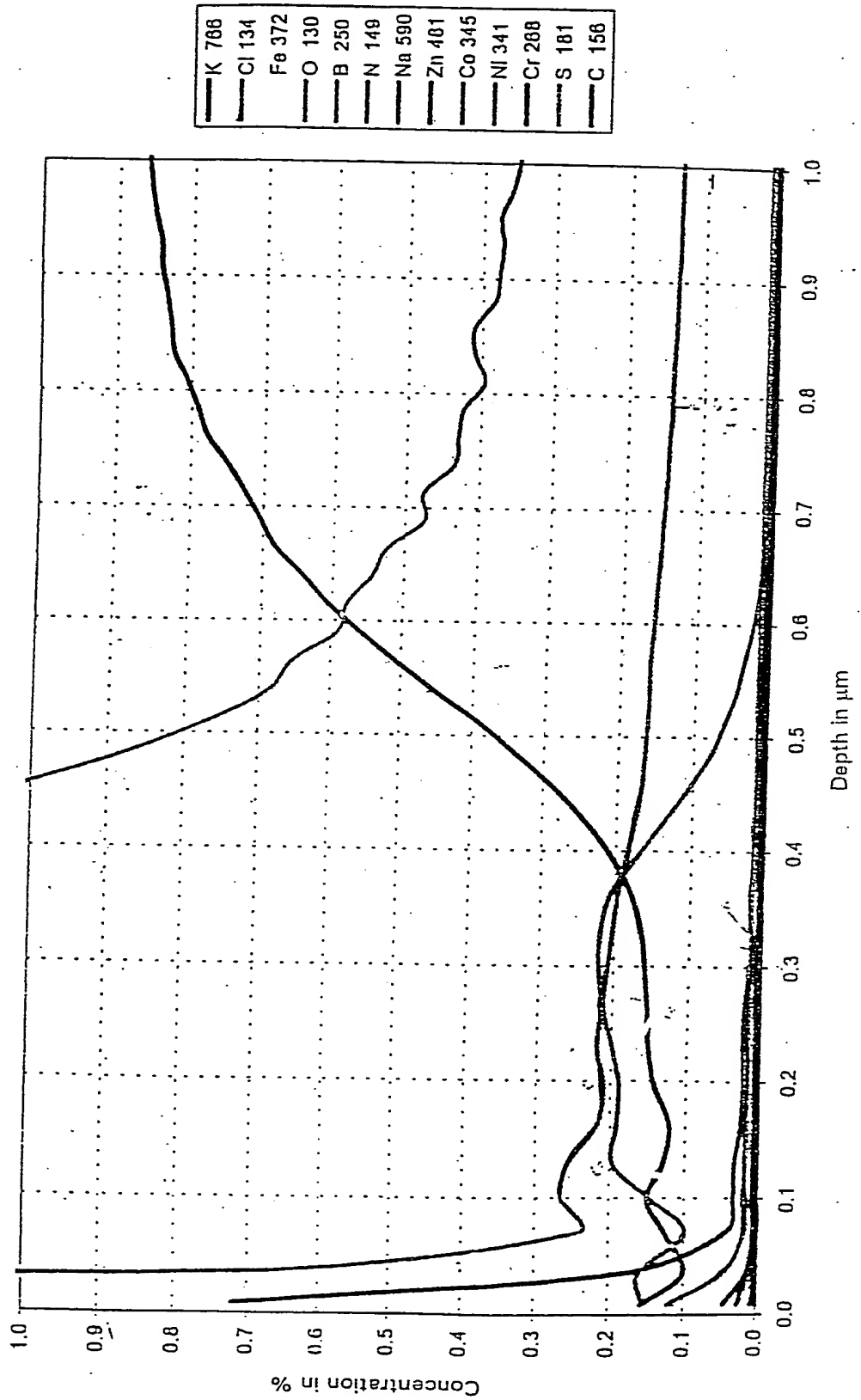


FIG. 11
Diagram 1
Sample 2, Measurement Position B

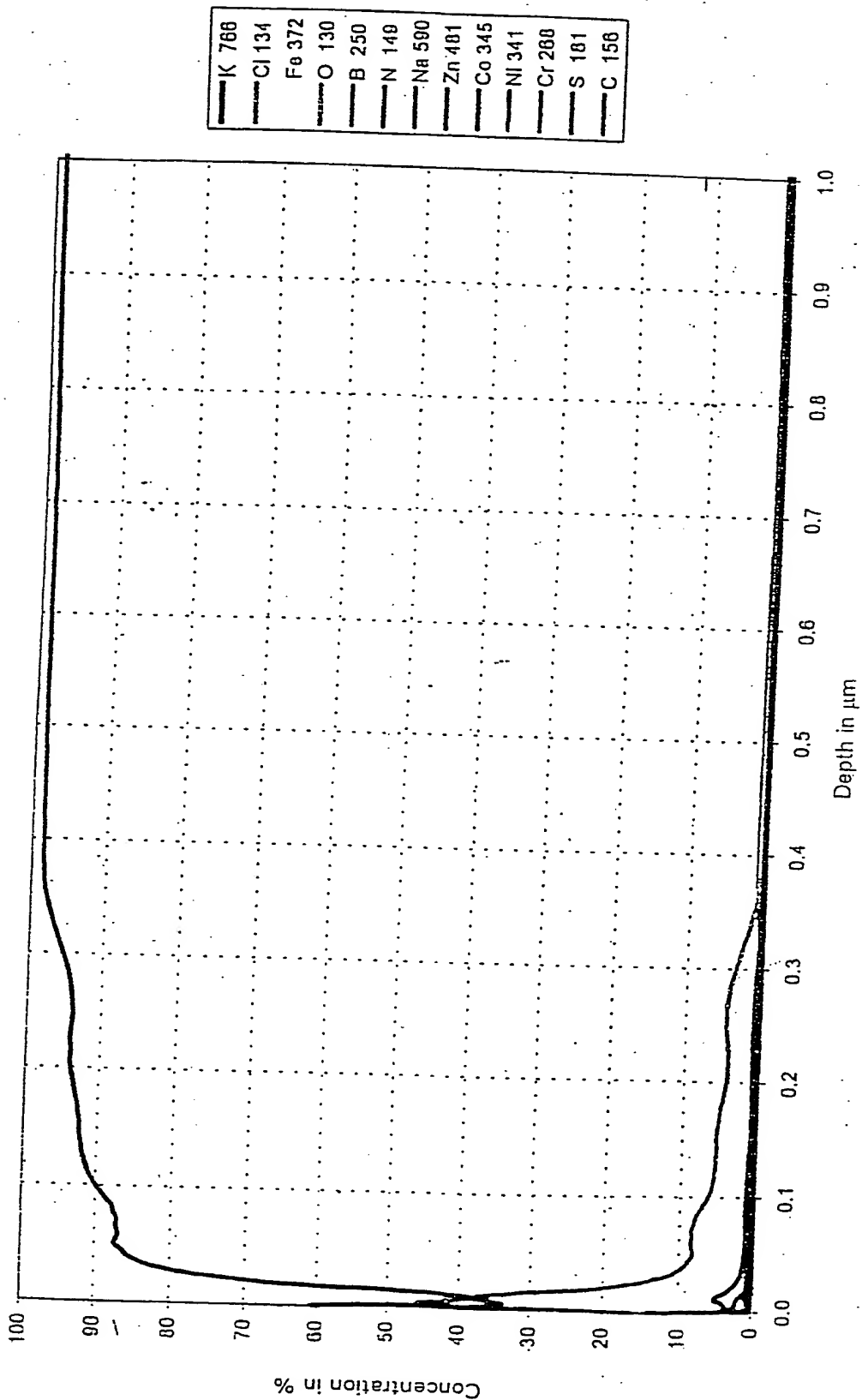


Diagram 2
Sample 2, Measurement Position B

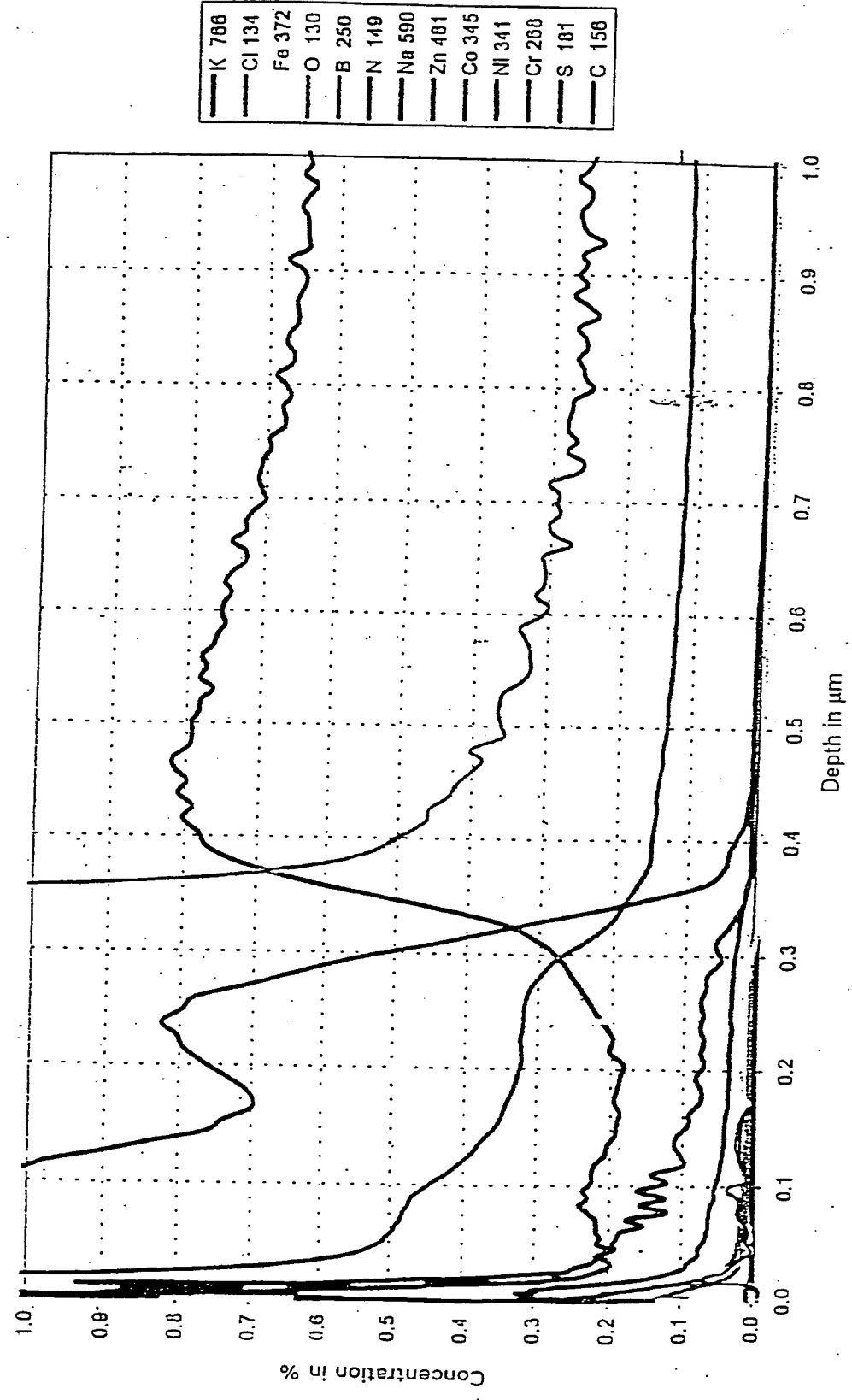
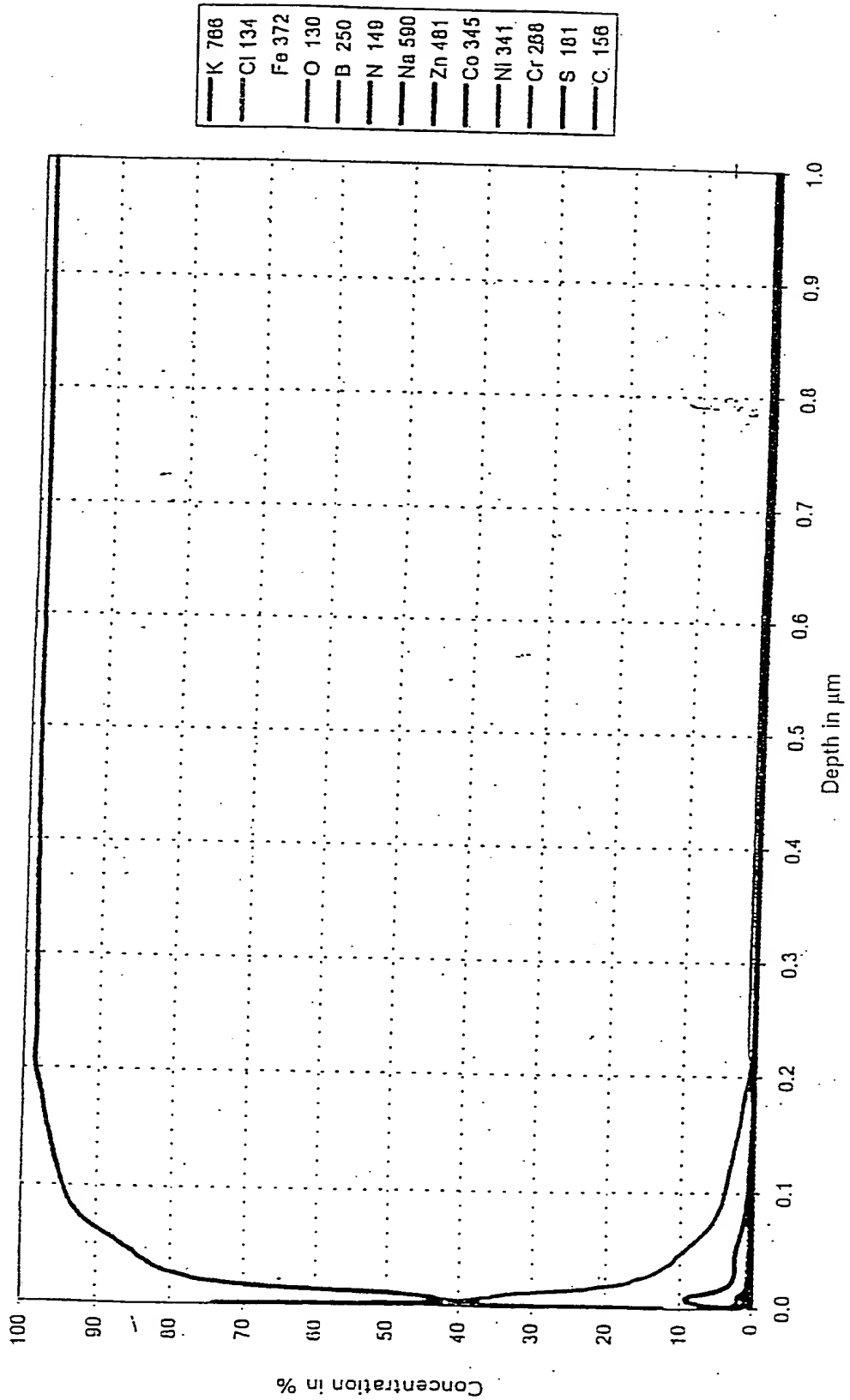


FIG. 12

Diagram 1
Sample 3, Measurement Position A



—	K 768
—	Cl 134
—	Fe 372
—	O 130
—	B 250
—	N 140
—	Na 500
—	Zn 481
—	Co 345
—	Ni 341
—	Cr 288
—	S 101
—	C 156

Diagram 2

Sample 3, Measurement Position A

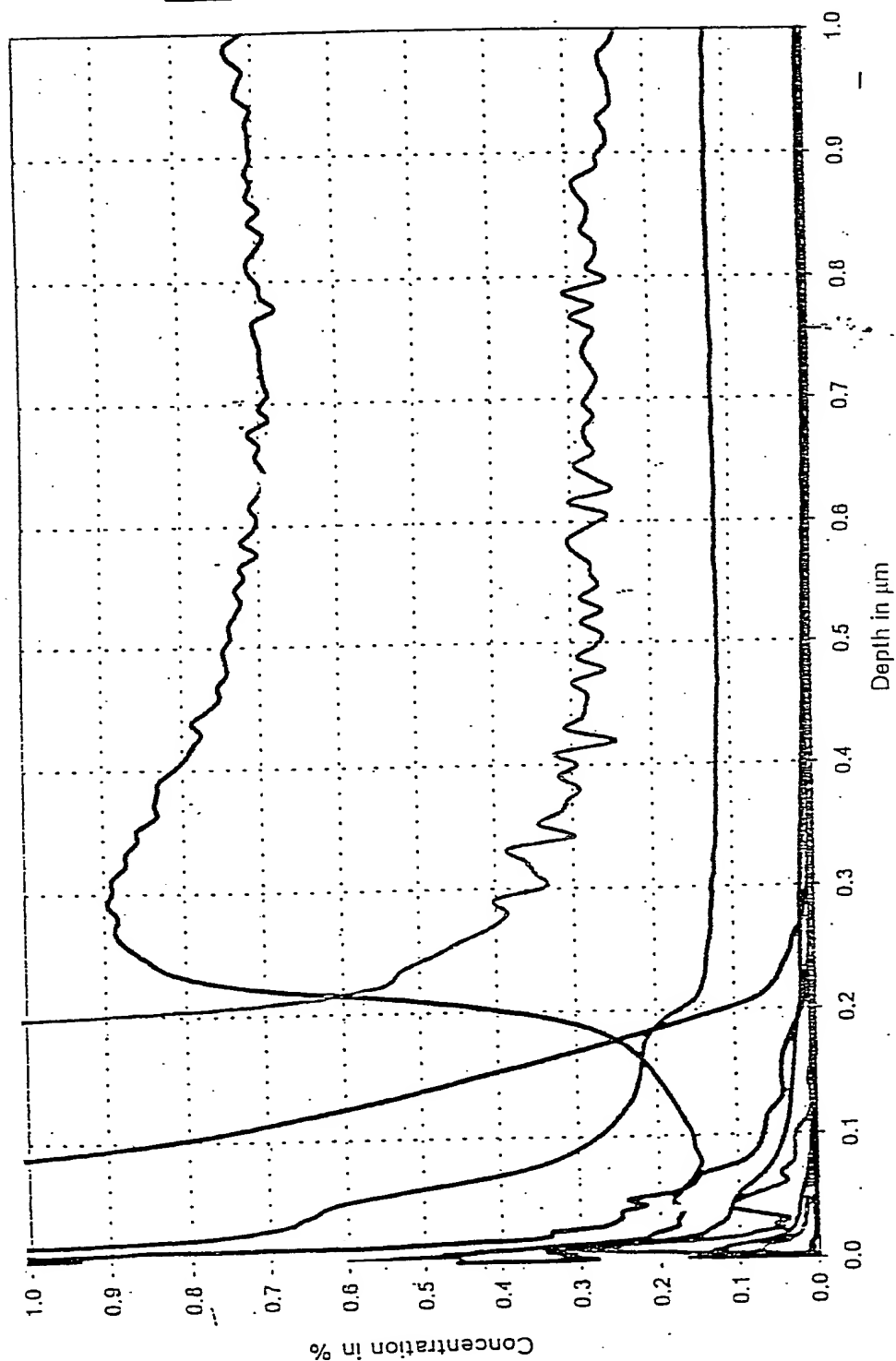


Diagram 1

Sample 4, Measurement Position A

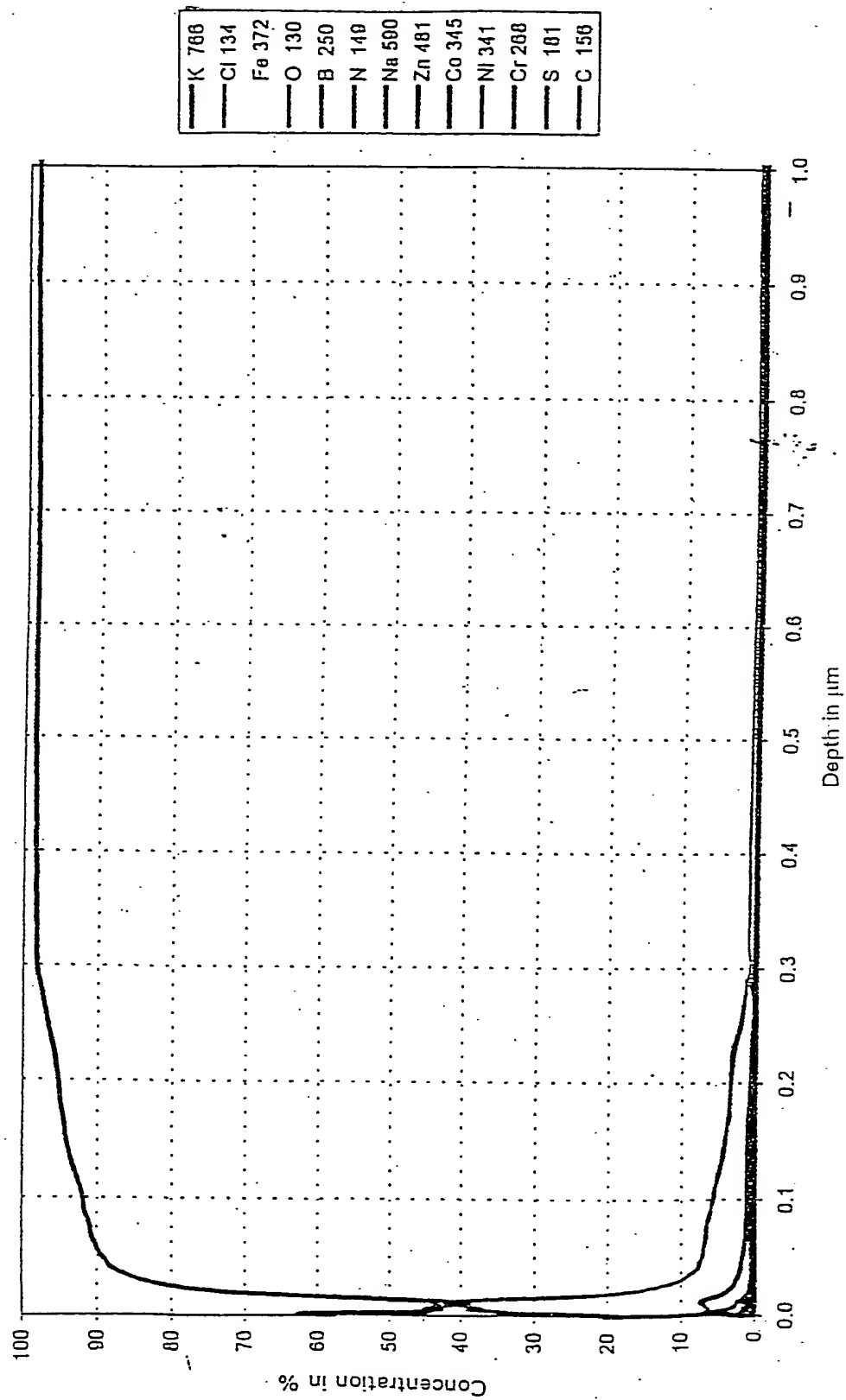


Diagram 2

Sample 4, Measurement Position A

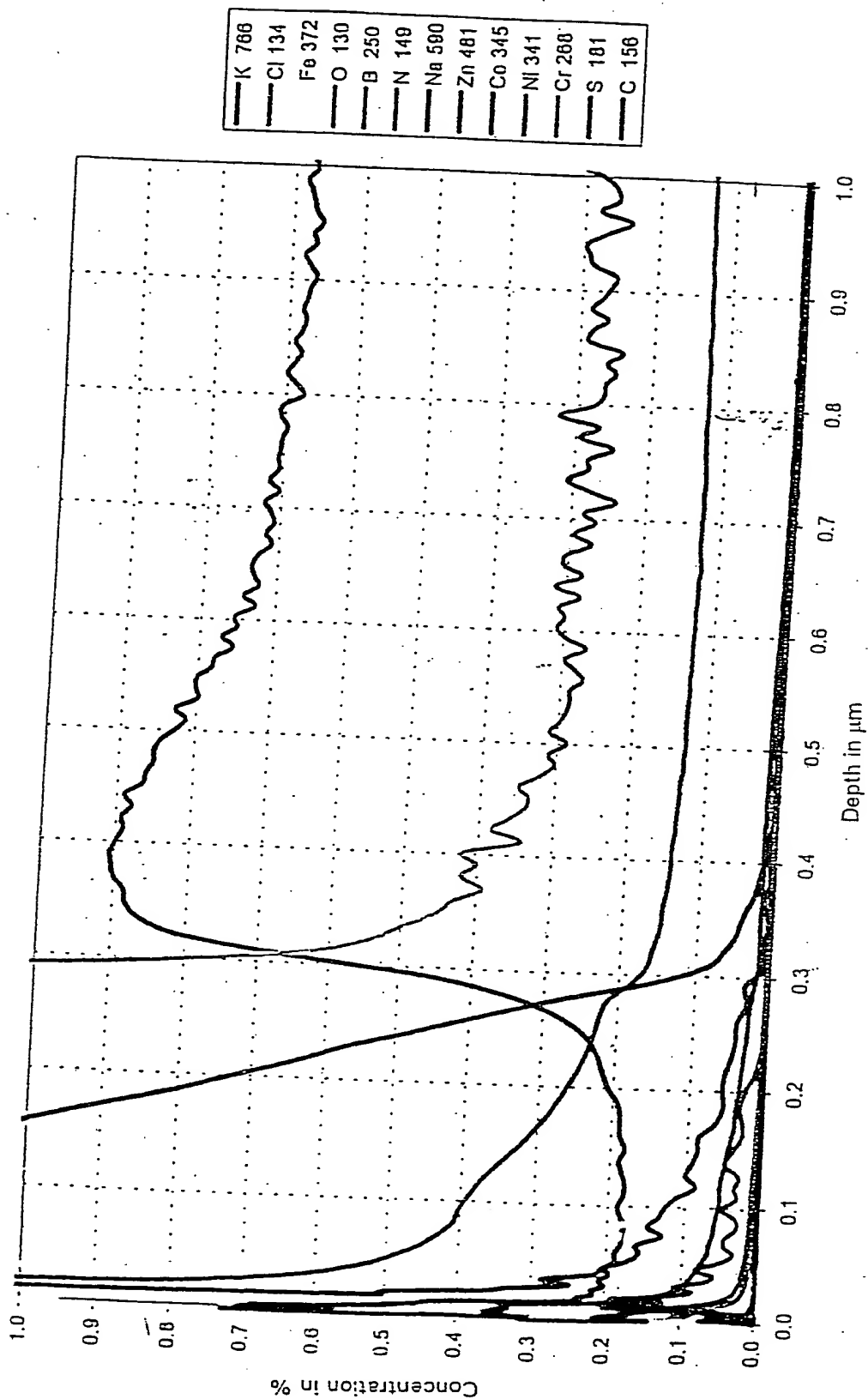


FIG. 17

Diagram 1

Sample 5, Measurement Position A

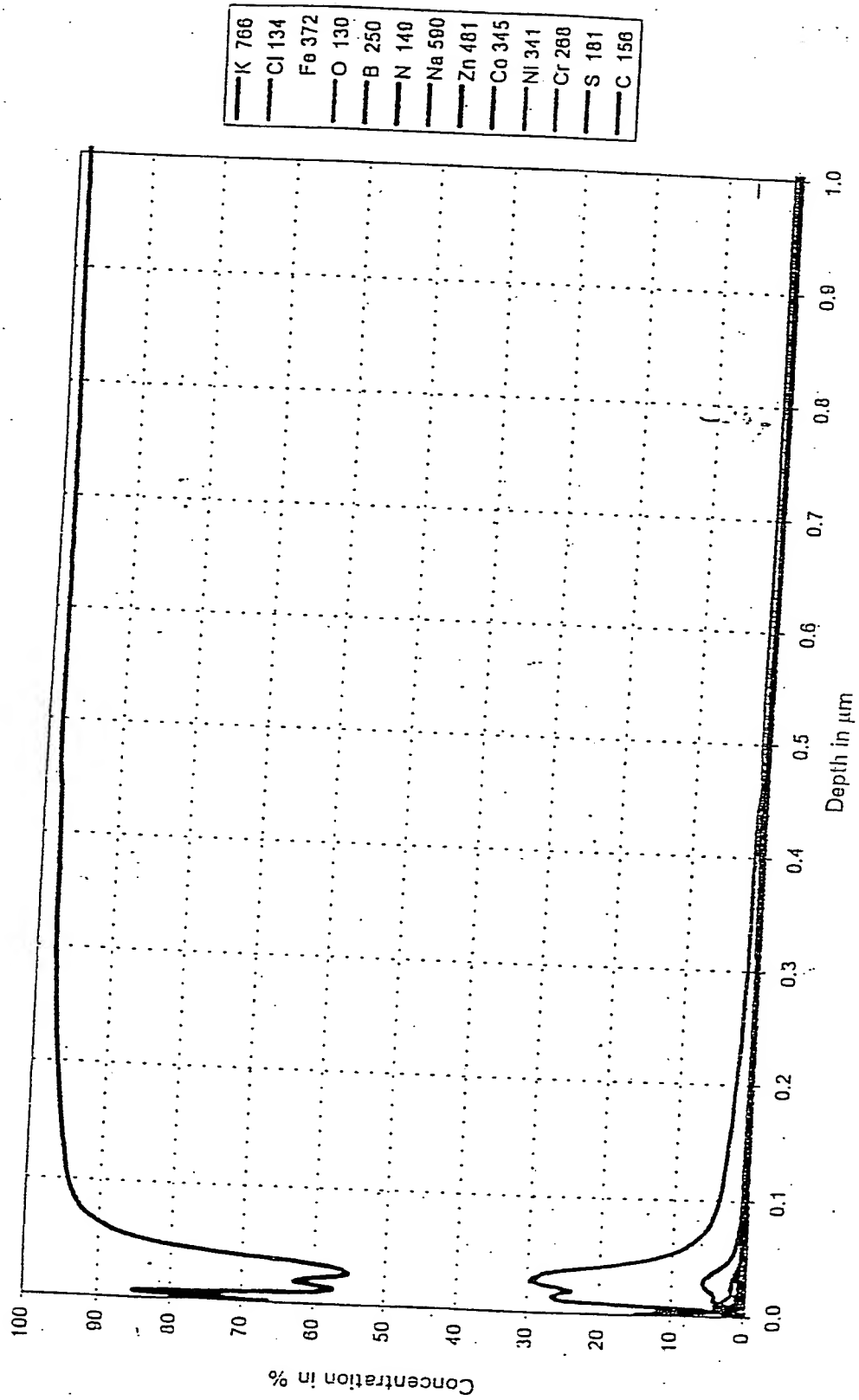
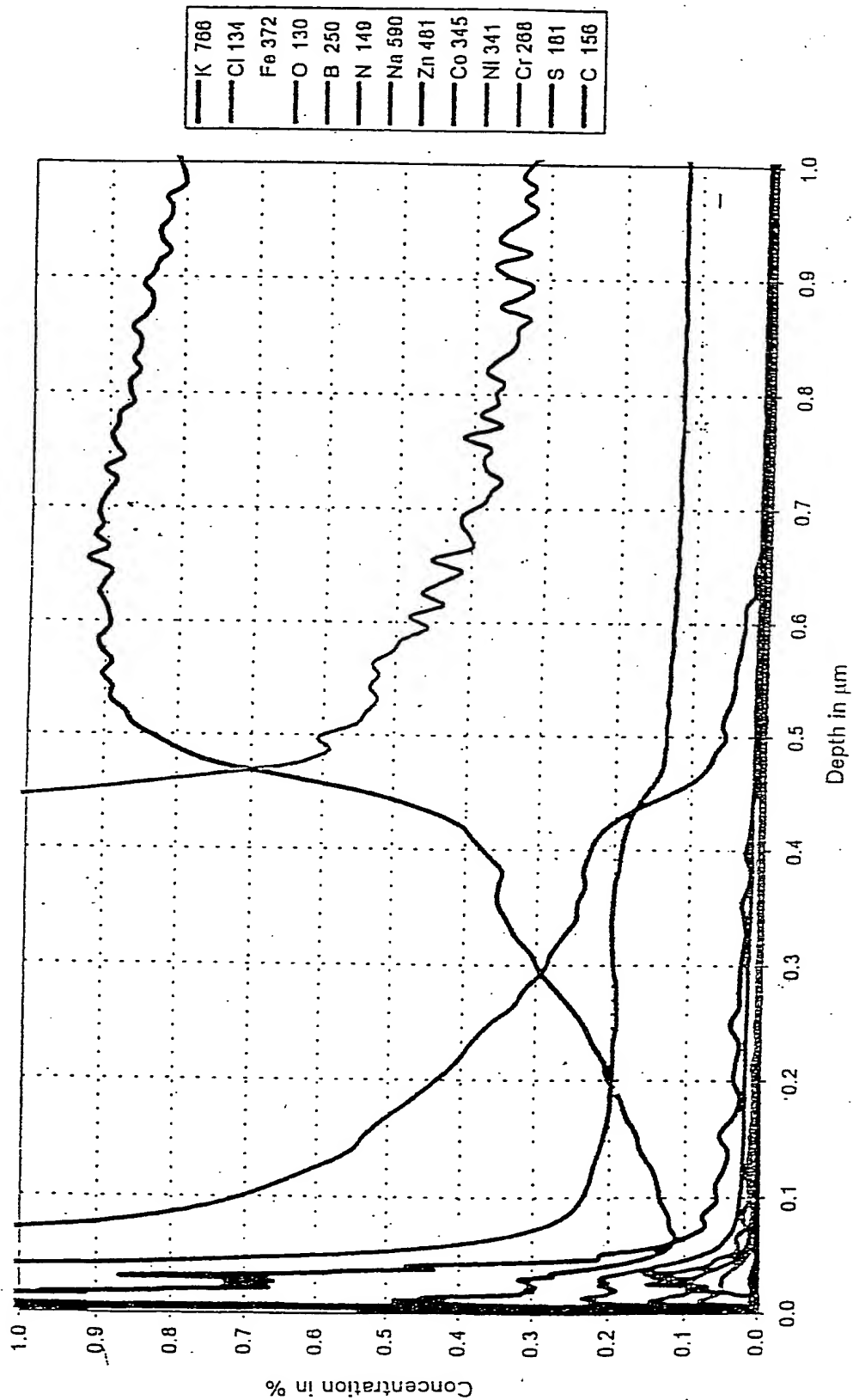


Diagram 2

Sample 5, Measurement Position A

FIG. 18



TOP SECRET 65643560

Diagram 1

Sample 6, Measurement Position A

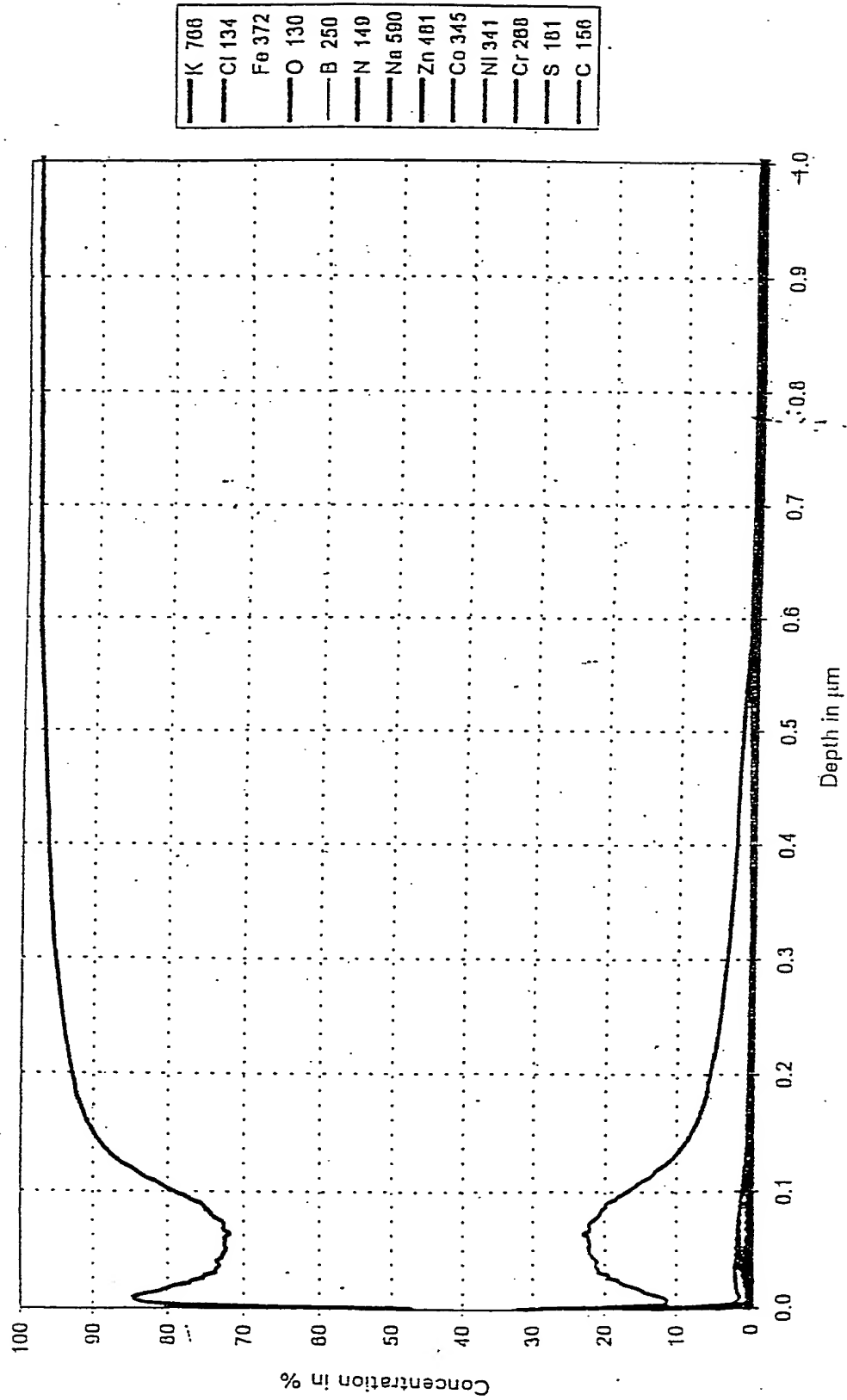


FIG. 19

FIG. 20

Diagram 1

Sample 6, Measurement Position A

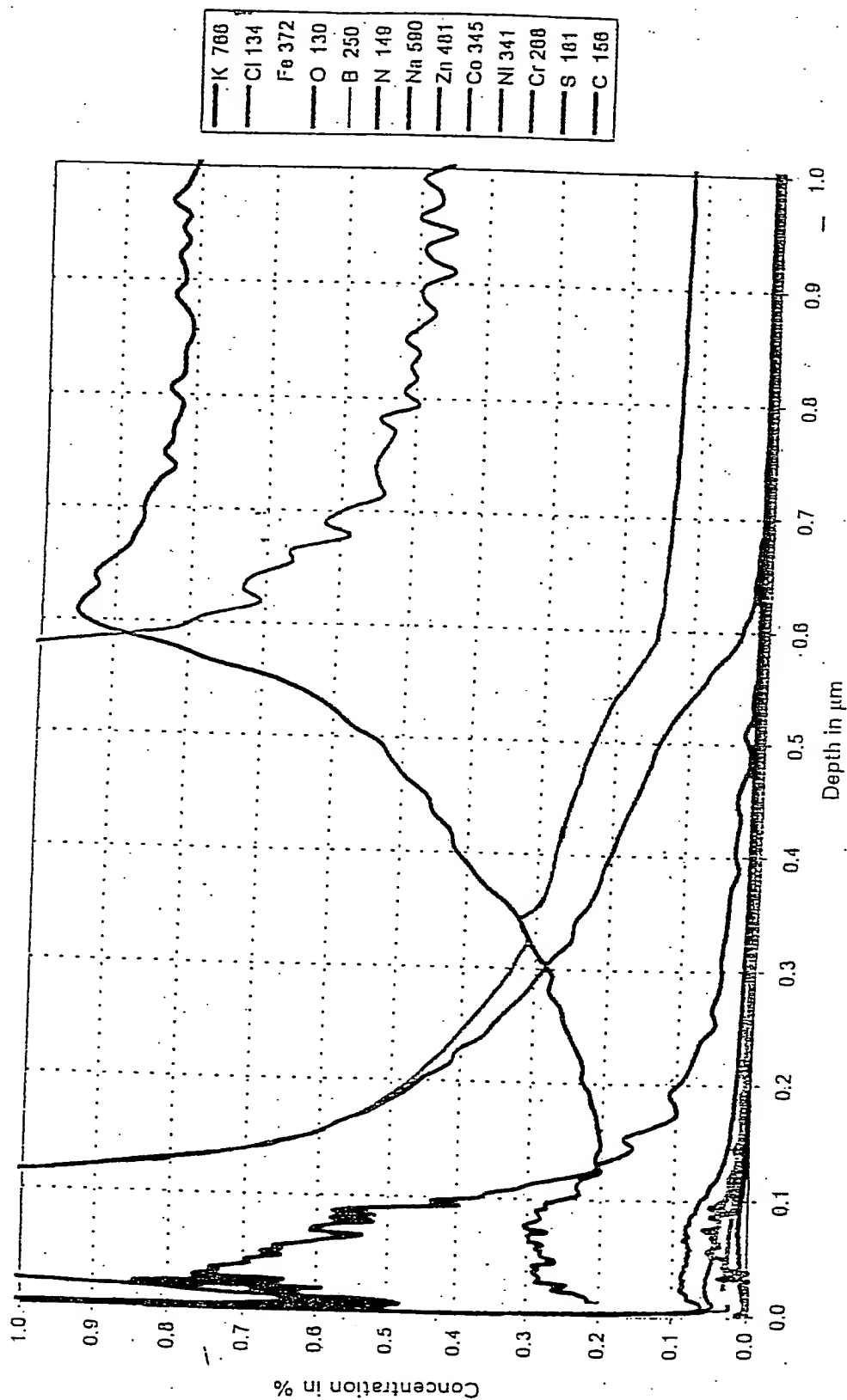


Diagram 1

Sample 6, Measurement Position B

FIG. 21

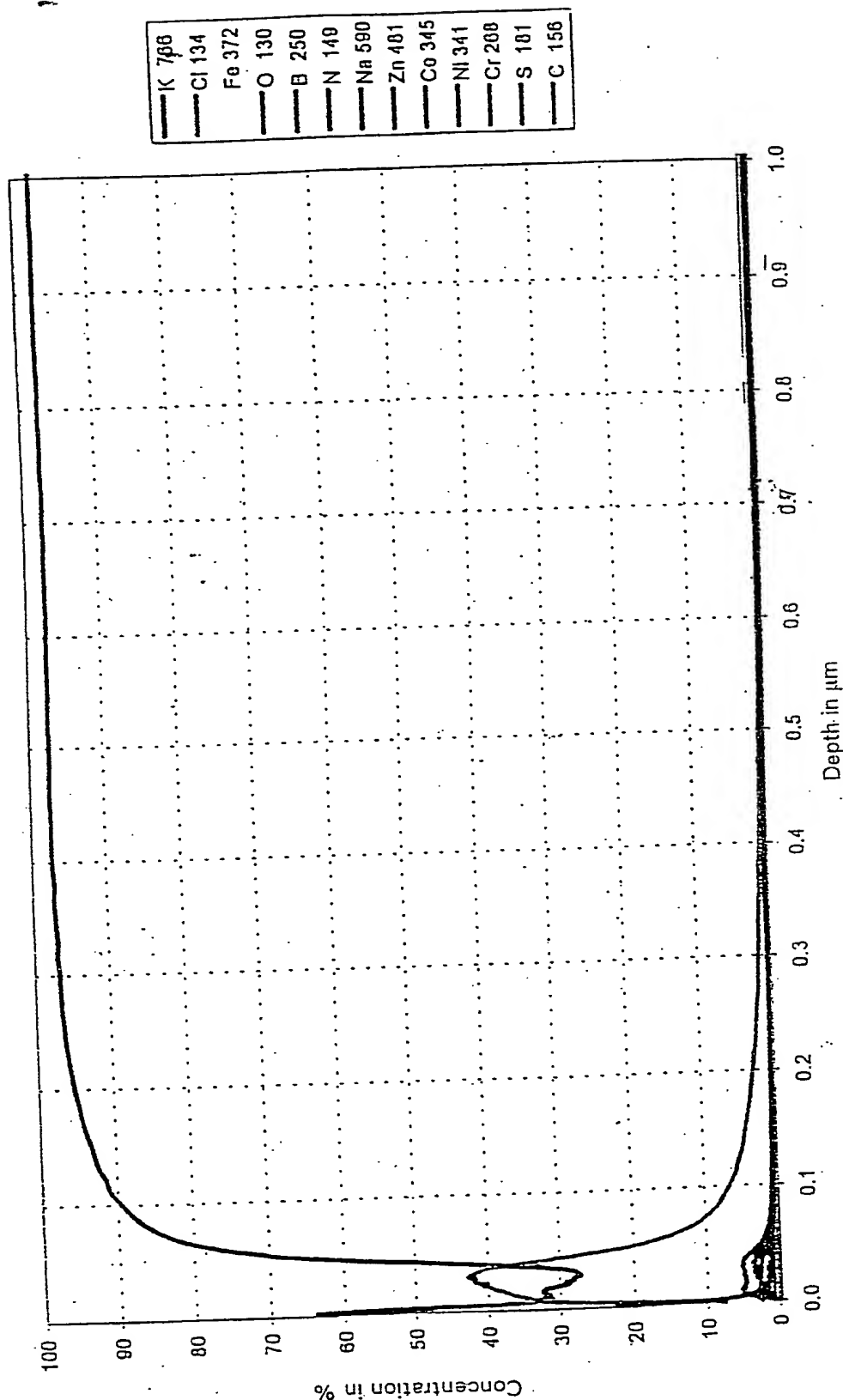


Diagram 2

Sample 6, Measurement Position B

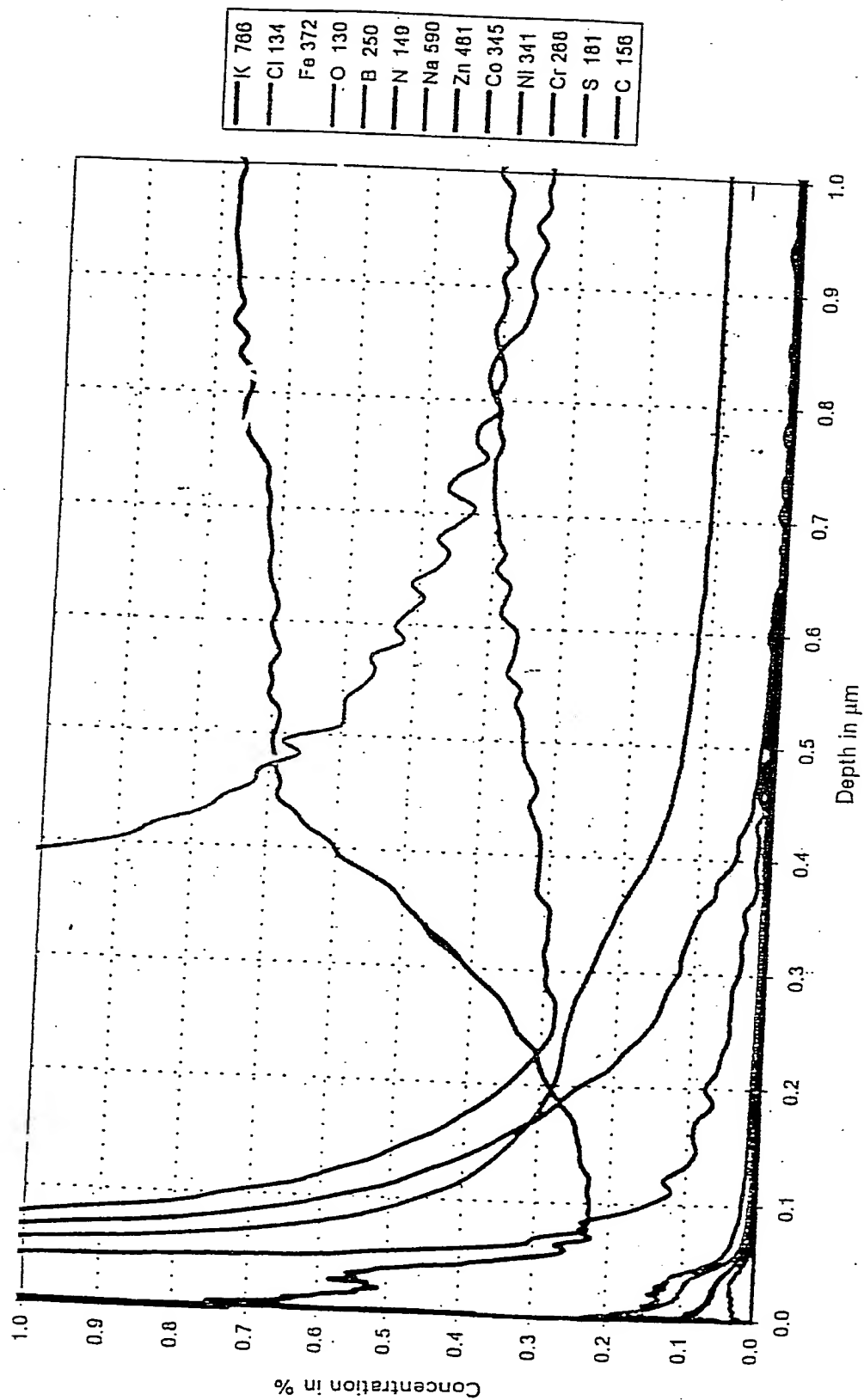


FIG. 22

FIG. 23

Diagram 1

Sample 6, Measurement Position C

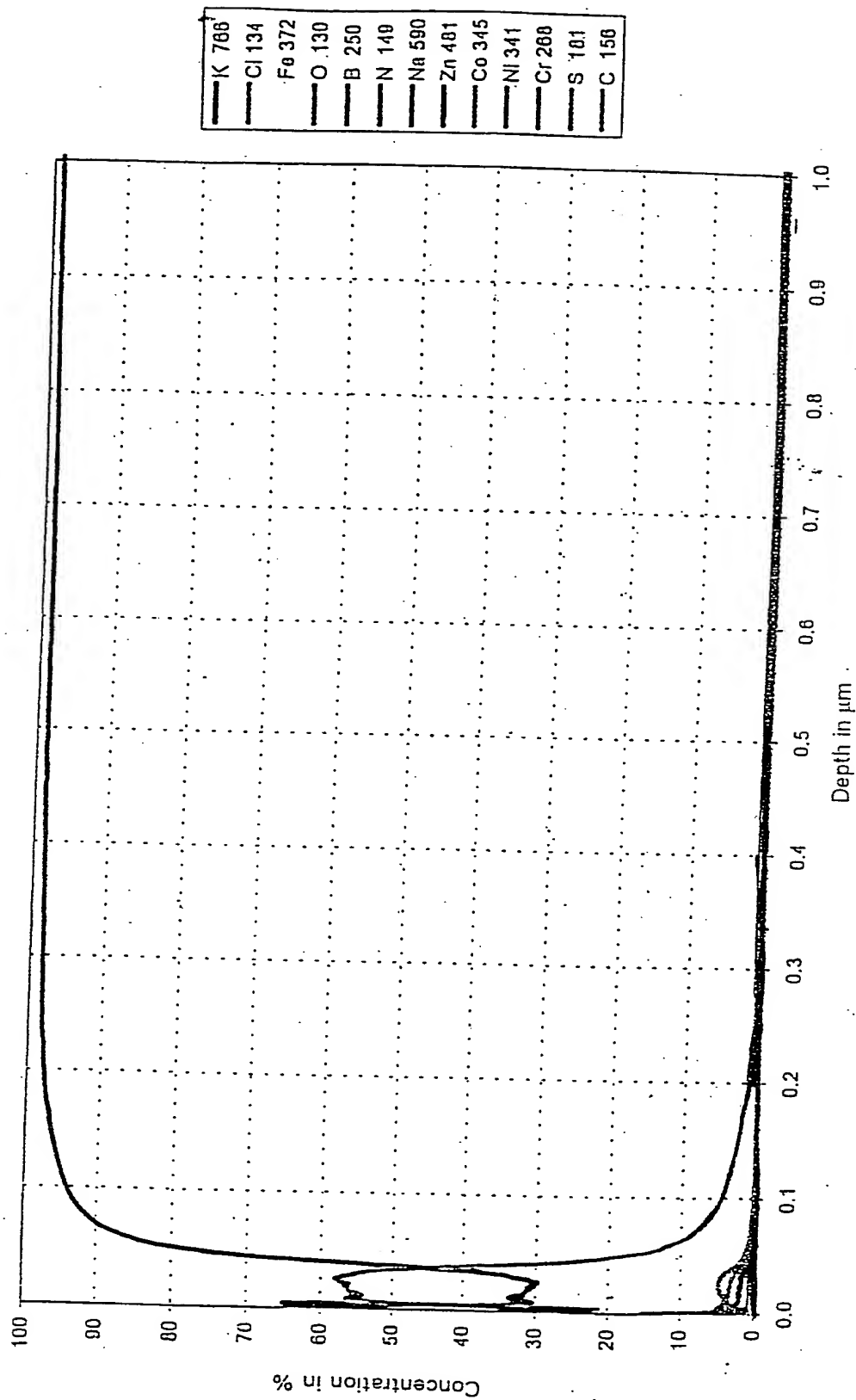


Diagram 2

Sample 6, Measurement Position C

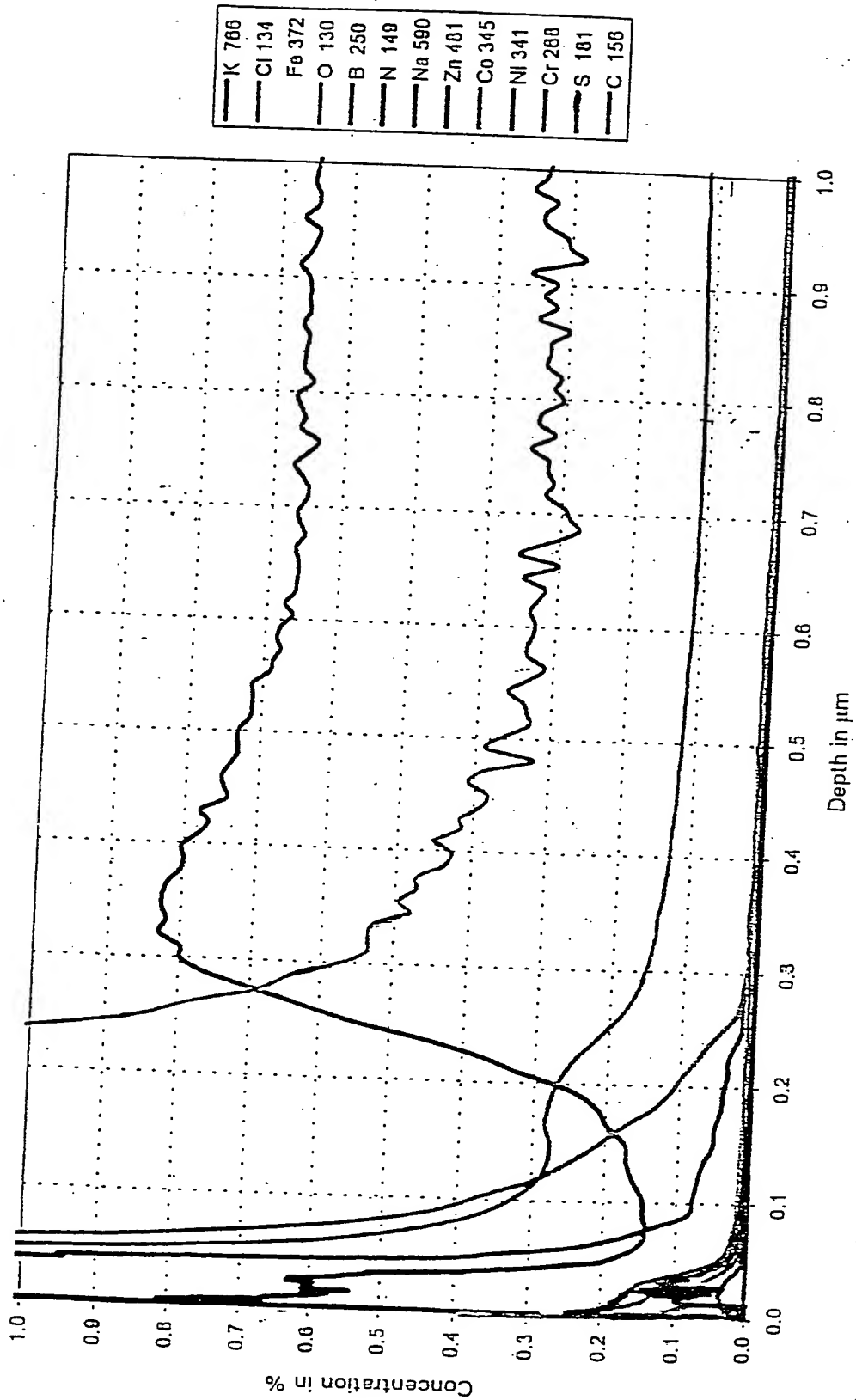
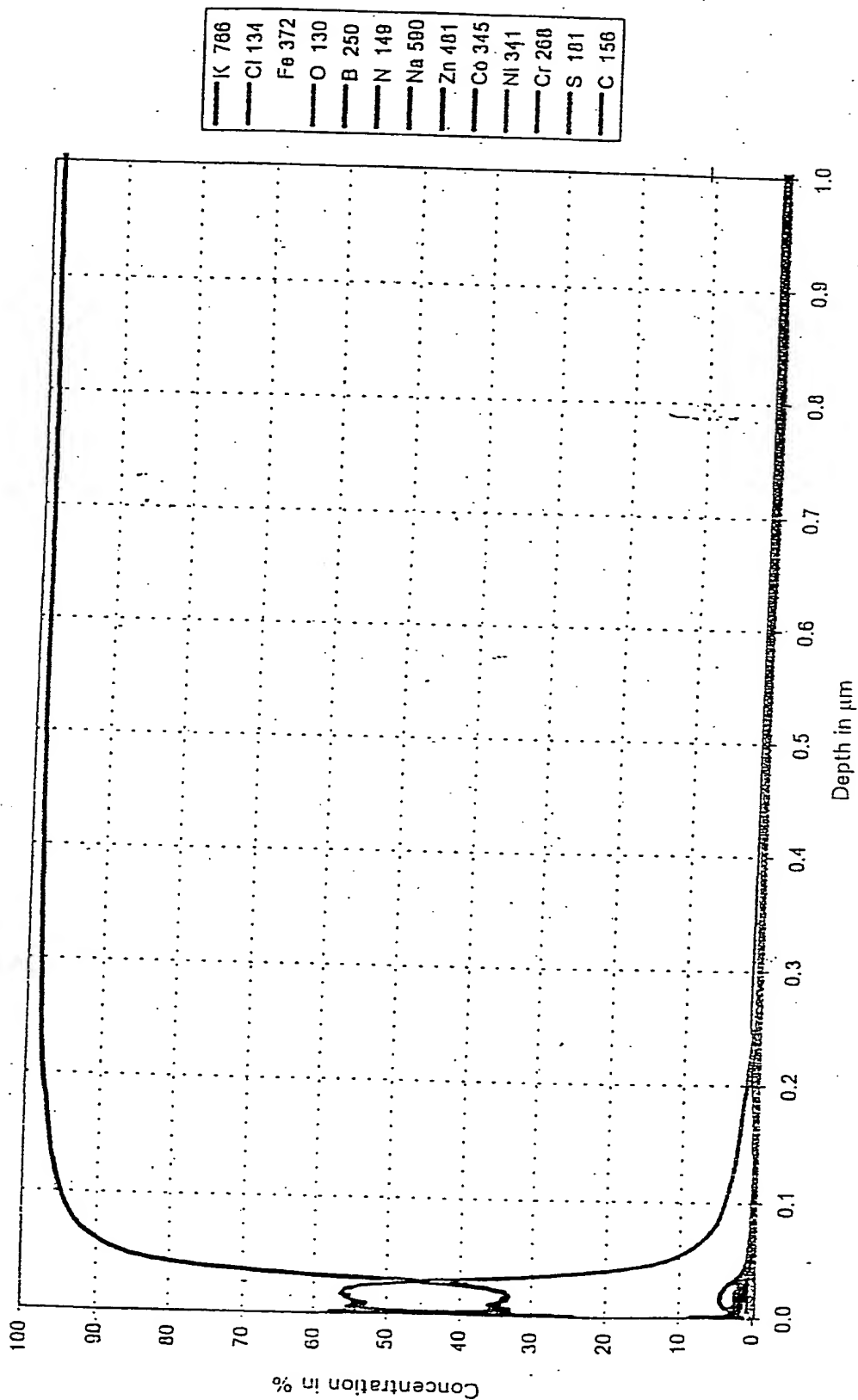


Diagram 1

Sample 6, Measurement Position D



CONFIDENTIAL

26/38

FIG. 26 Sample 6, Measurement Position D

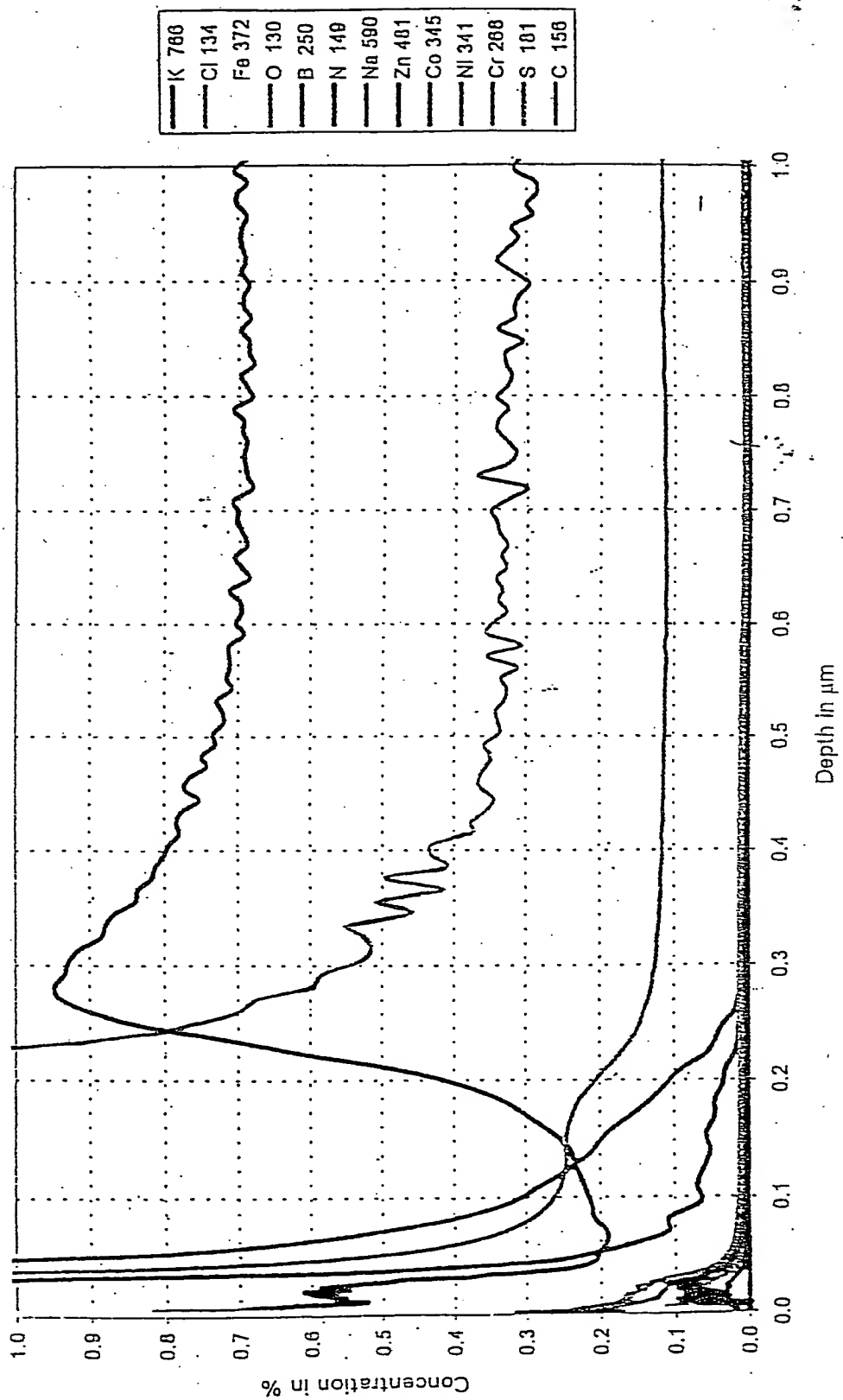


Diagram 1

Sample 7, Measurement Position A

FIG. 27

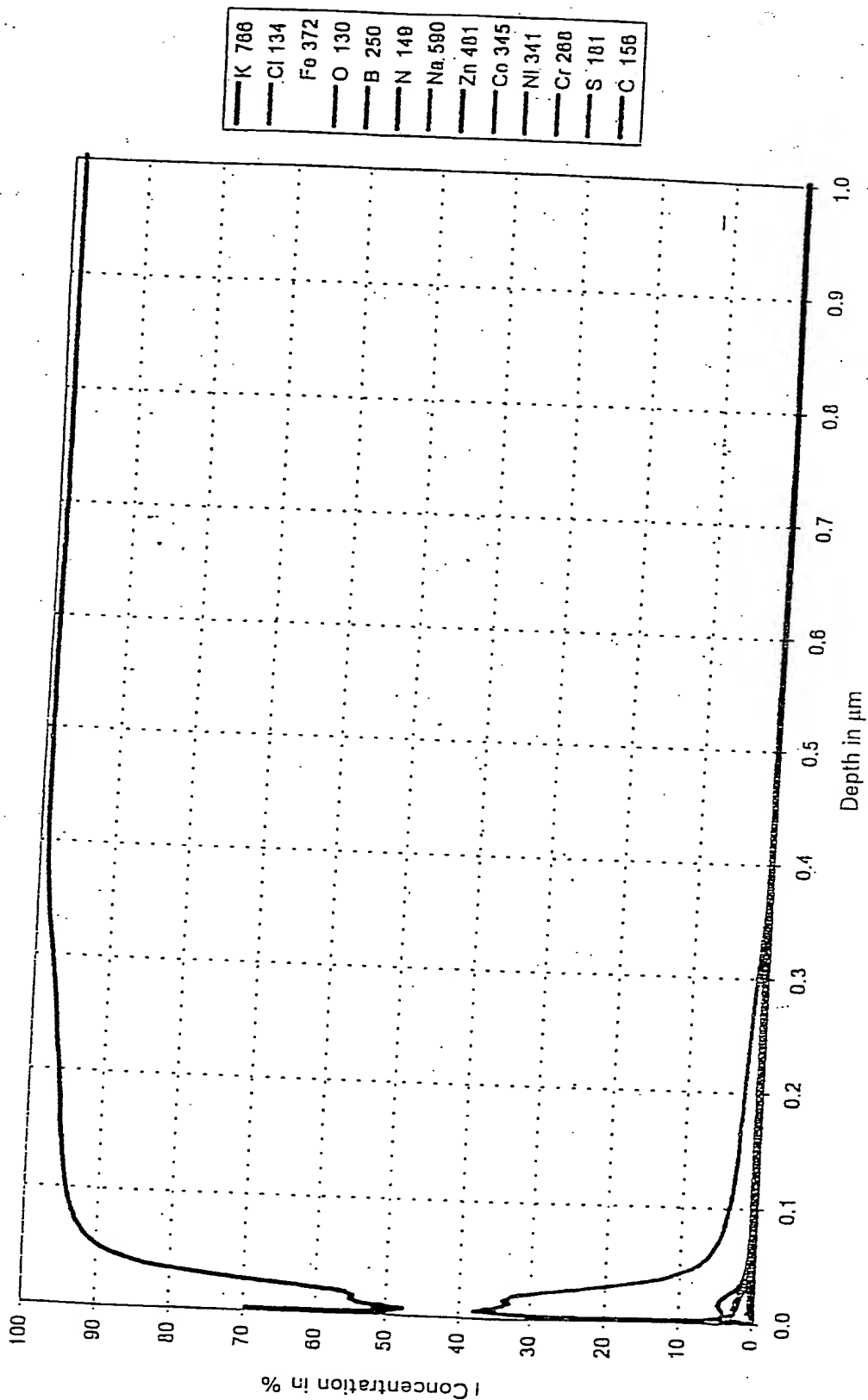
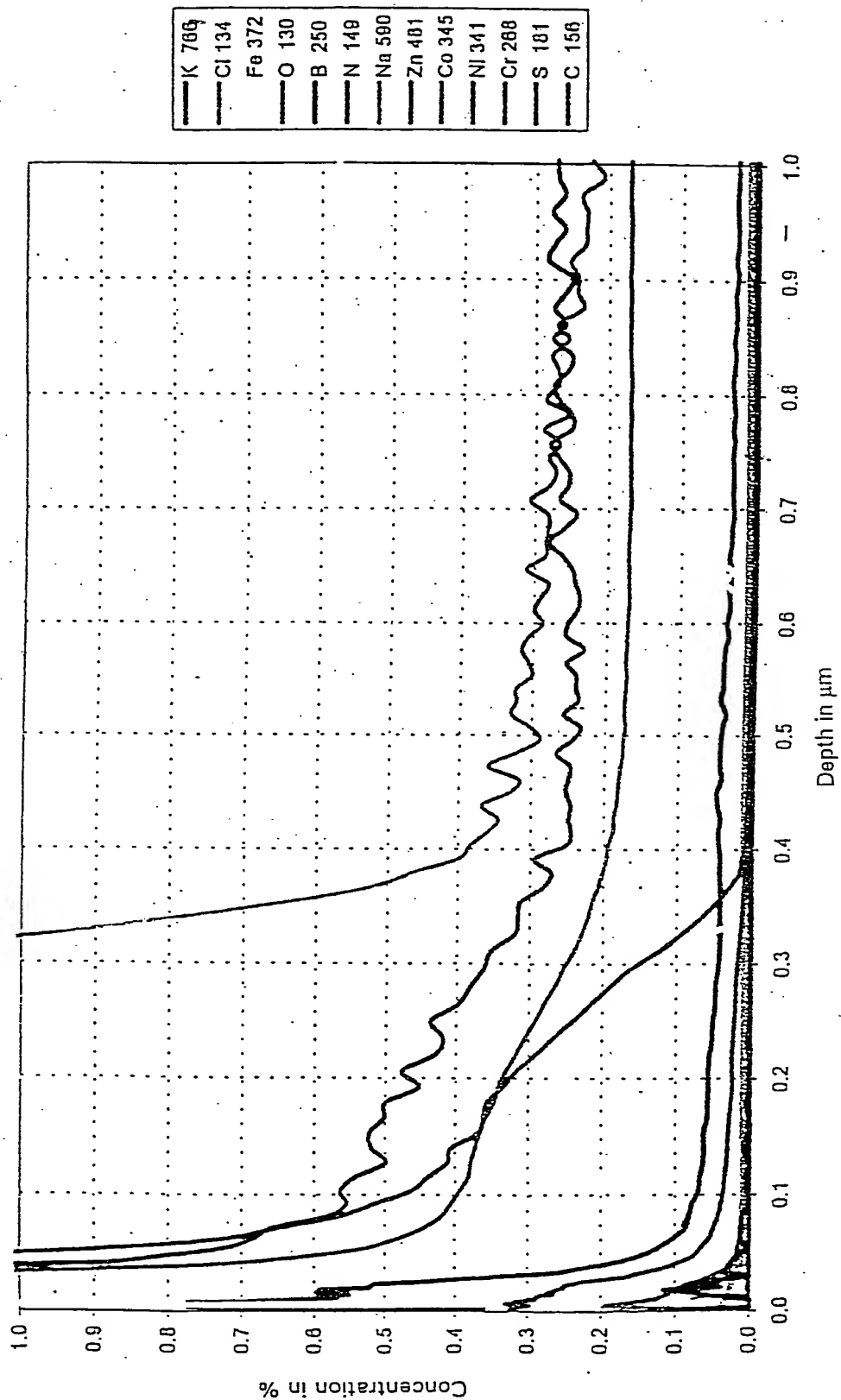


FIG. 28

Diagram 2

Sample 7, Measurement Position A



TOP OF 6640600

Diagram 1

Sample 7, Measurement Position B

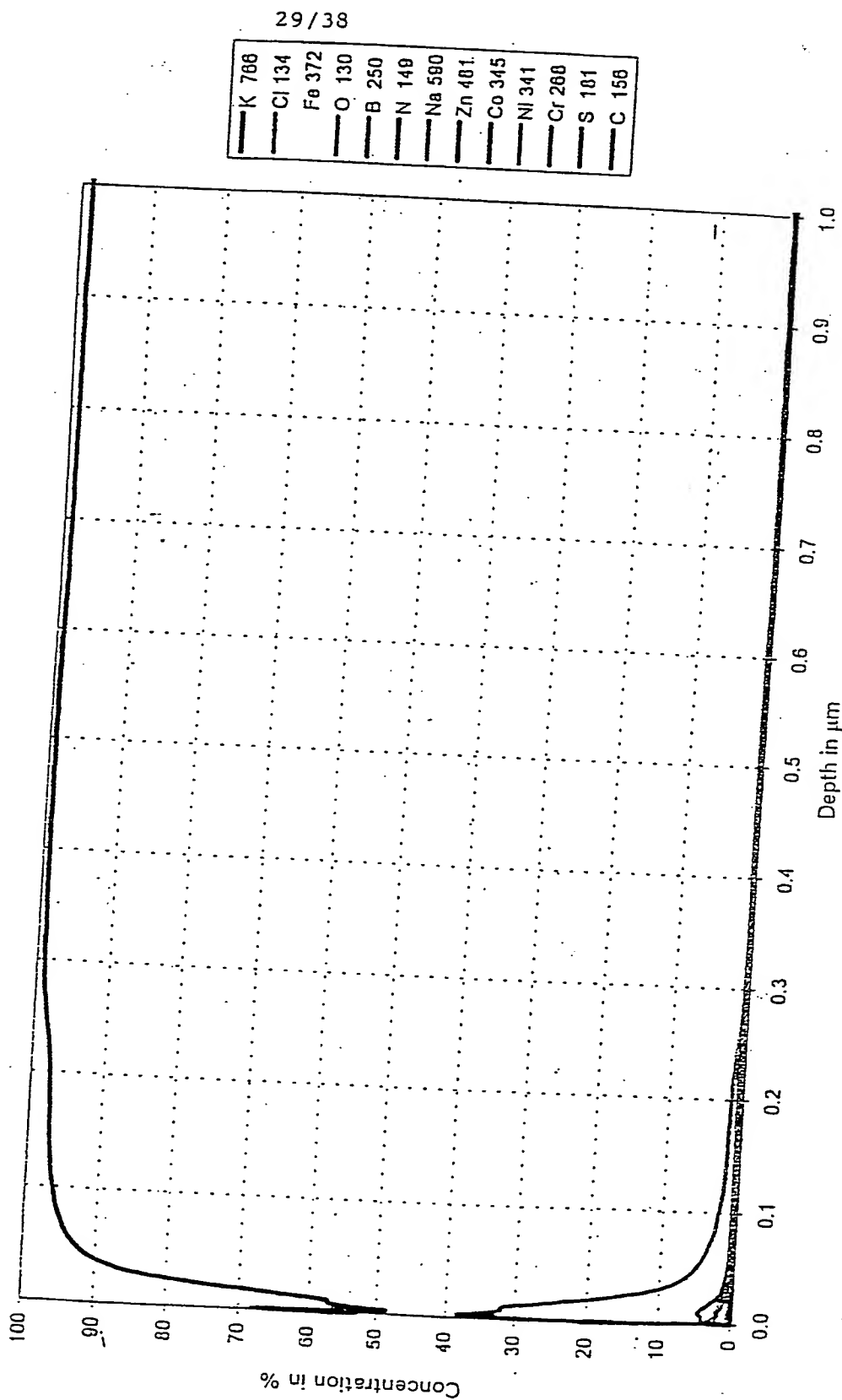


Diagram 2

Sample 7, Measurement Position B

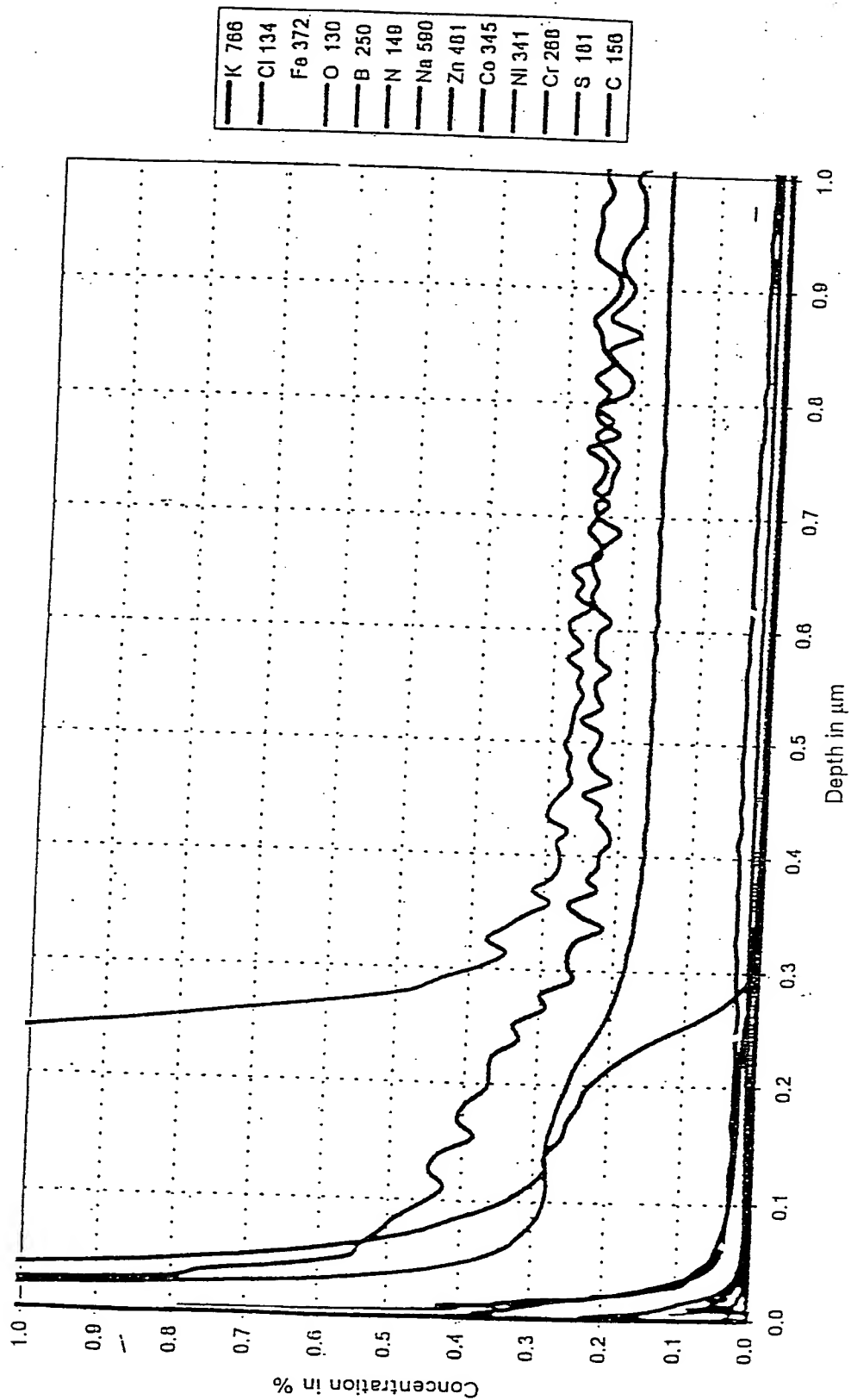


Diagram 1

Sample 8, Measurement Position A

FIG. 31

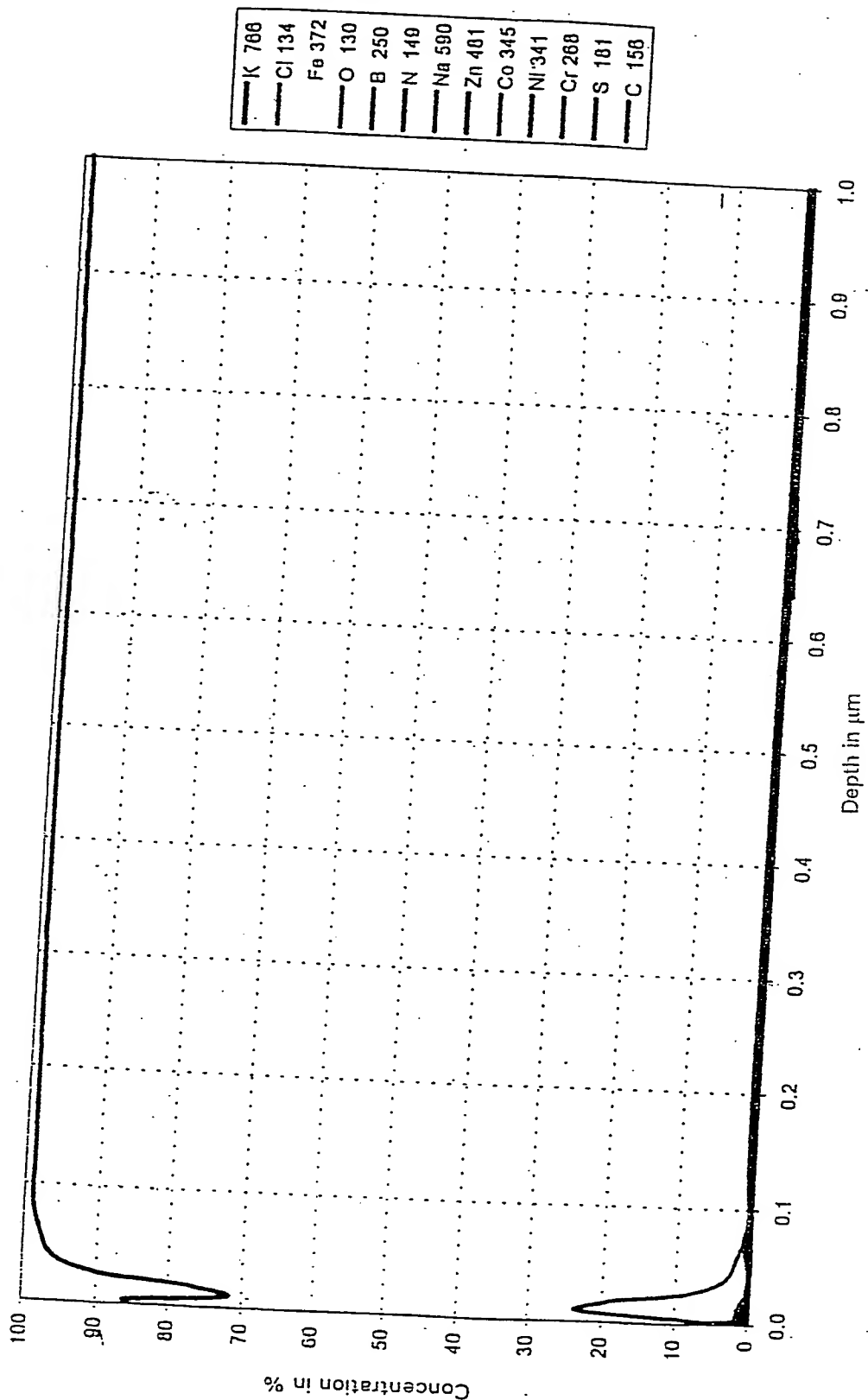


Diagram 2

Sample 8, Measurement Position A

FIG. 32

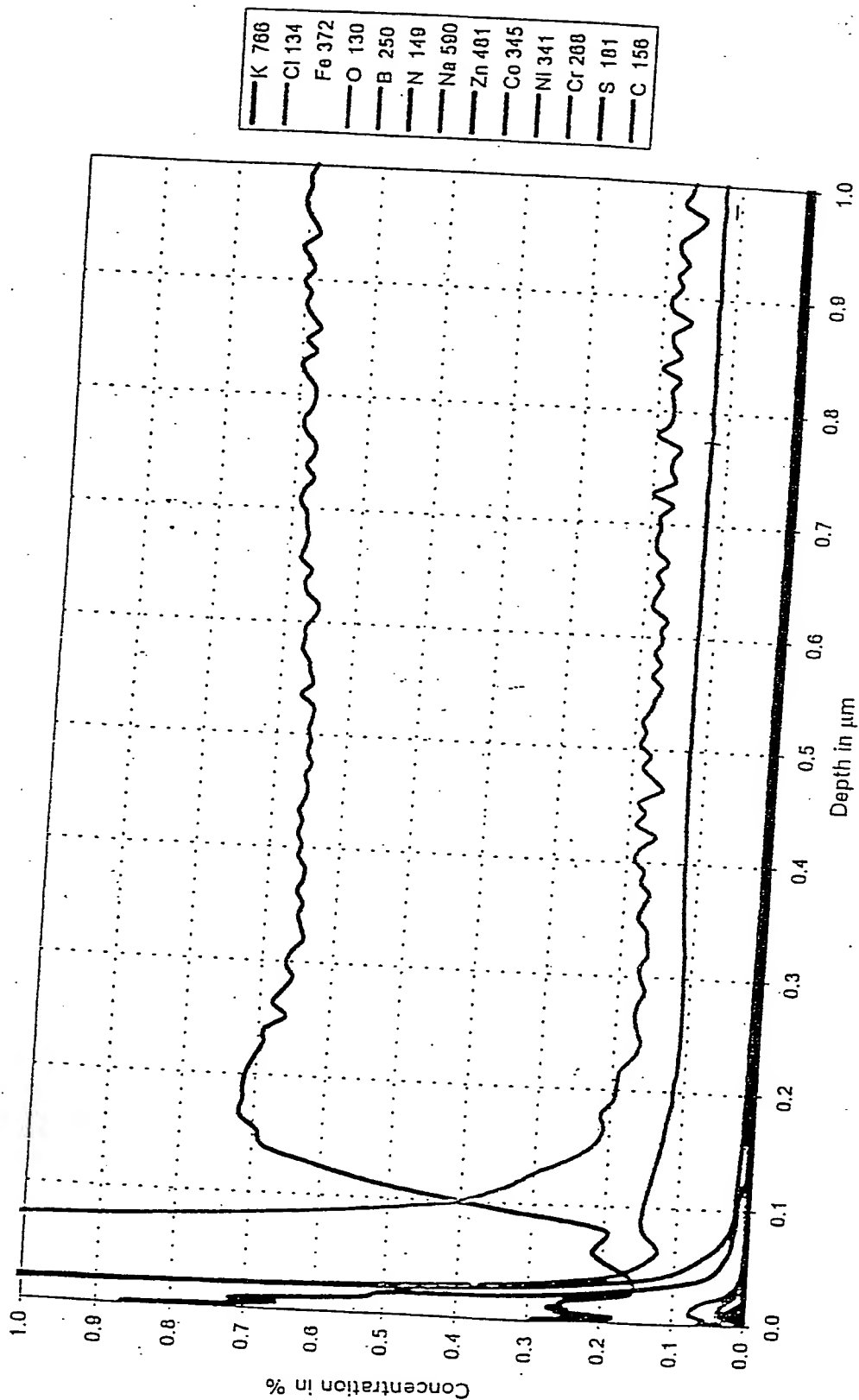


FIG. 33

Diagram 1

Sample 9, Measurement Position A

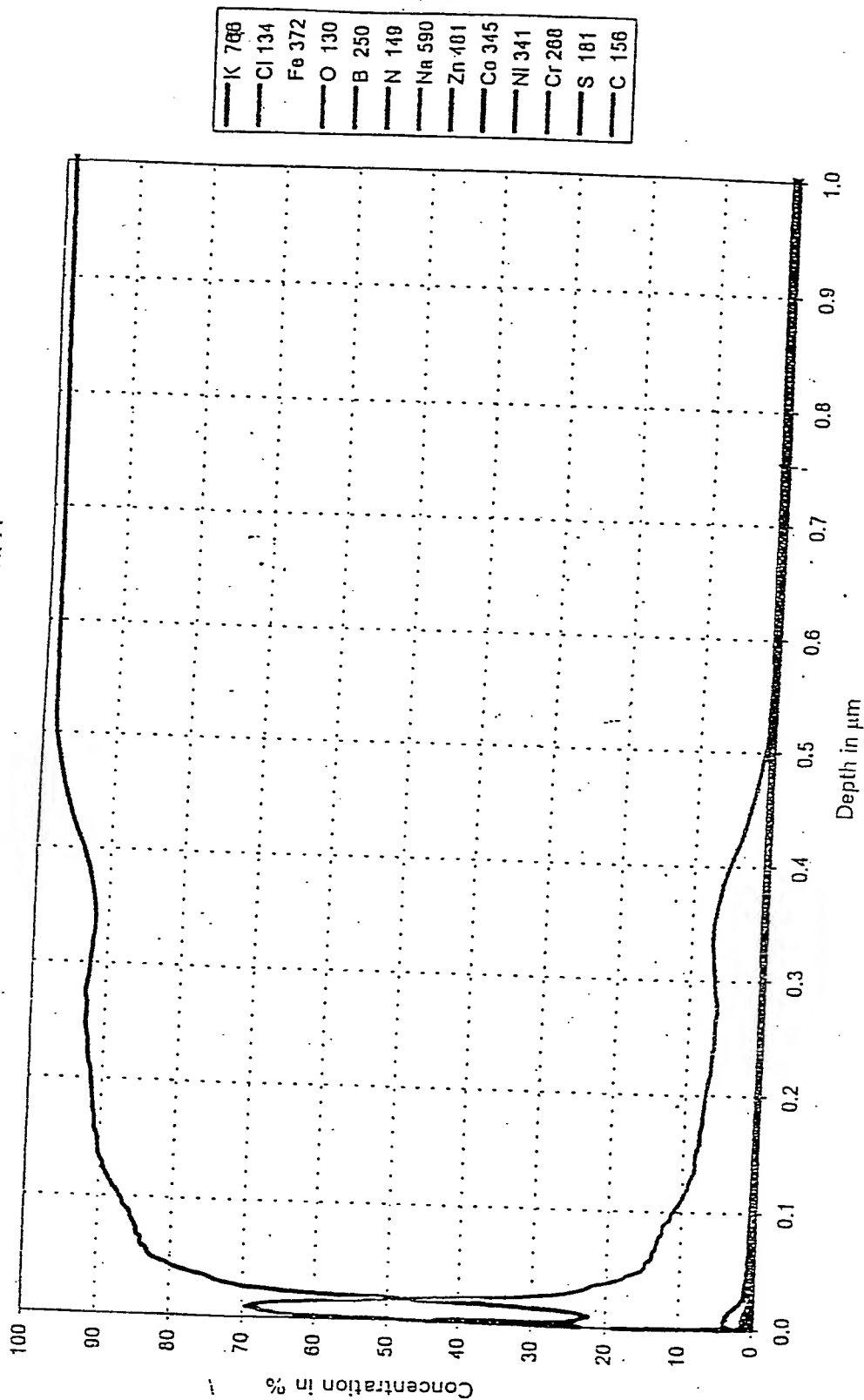
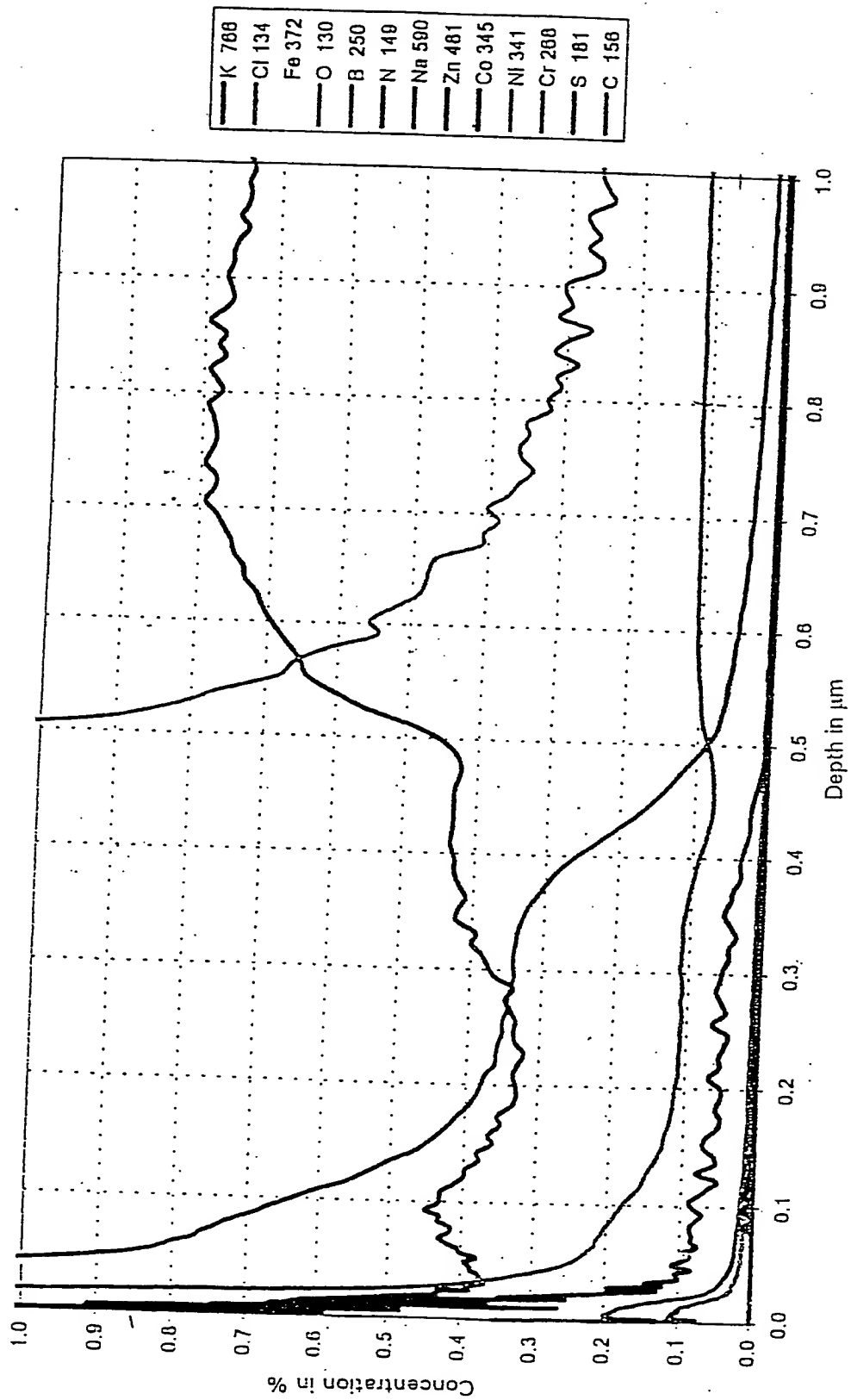


Diagram 2
Sample 9, Measurement Position A

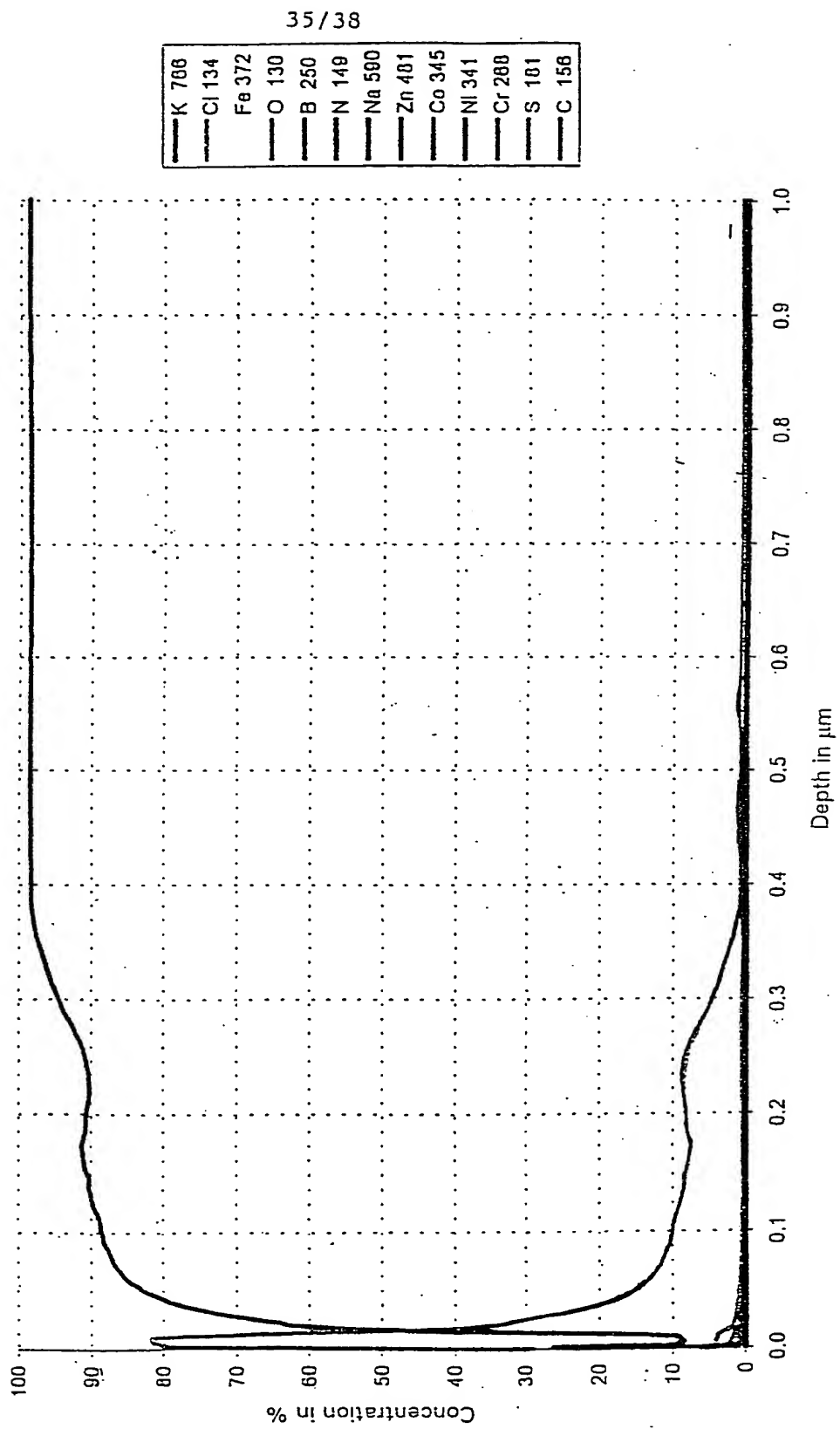


FOOTER 000000

Diagram 1

Sample 9, Measurement Position B

FIG. 35



FOOT 000000

Diagram 2

Sample 9, Measurement Position B

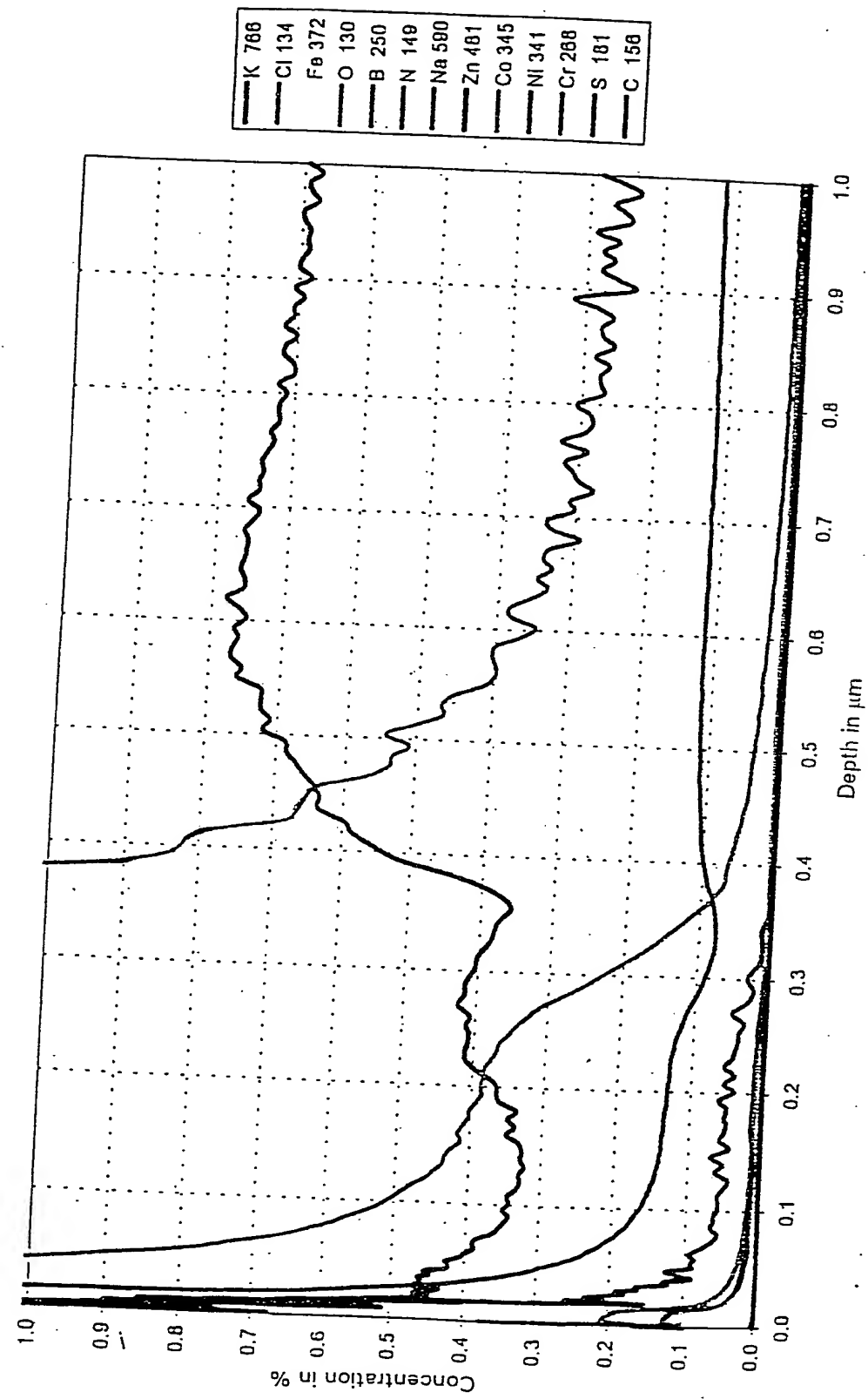


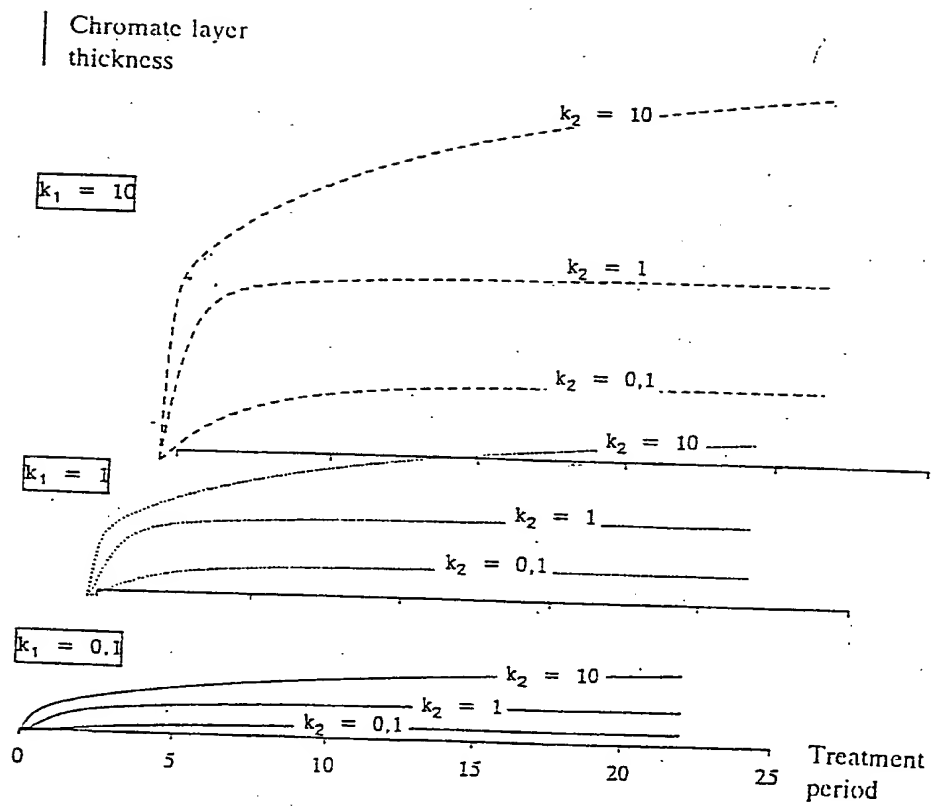
FIG. 37

37/38

	Methods		SEM nm	Glow-discharge spectrometer			Sample No.	
	Ellipsometry nm	nm (Cr > 1%)		with Cr (%)	chromium index nm (Cr > Zn)	nm (Cr > 30%)		
1. Prior Art								
Yellow chromation Cr(III) + Cr(VI)	-	300	440	11	48	17	25	9
Blue chromation Cr(III)	98	60	60	8	5	0	0	8
2. Invention (Chromitization)								
60 °C Cr(III)	432	300	344	7	23	2	15	1,2,3,4,5
100 °C Cr(III)	595	-	358	10	38	22	28	6
60 °C on Zn/Fe Cr(III)	-	-	282	6	16	0	16	7
100 °C, two-fold concentration Cr(III)	953	-	-	-	-	-	-	-

Fig. 38

38/38



Computer simulation of the kinetic model of
chromate coating of zinc for various rate constants